SUPER®

SUPER® X7DAL-E+

USER'S MANUAL

Revision 1.1

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Preface

About This Manual

This manual is written for system integrators, PC technicians and knowledgeable PC users. It provides information for the installation and use of the SUPER® X7DAL-E+ motherboard. The SUPER® X7DAL-E+ supports dual Intel Quad-Core and Dual-Core processors with a front side bus speed of 1.333 GHz/1.066 GHz/667 MHz. With two 64-bit Quad-Core and Dual-Core processors built-in, the X7DAL-E+ offers substantial functionality enhancements to the motherboards based on the Intel Core Microarchitecture cores while remaining compatible with the IA-32 software. The features include Intel Hyper-Threading Technology, Virtualization Technology, Hyper Pipelined Technology, Execution Trace Cache, Thermal Monitor 1/2 (TM1/TM2), Enhanced Intel SpeedStep technology, Advanced Dynamic Execution, Advanced Transfer Cache, Streaming SIMD Extensions 3 (SSE3) and Extended Memory 64 Technology (EM64T). These features allow the motherboard to operate at much higher speeds with better power management in much safer thermal environments than the traditional motherboards. The X7DAL-E+ is ideal for high performance quad-processor or dual-processor (DP) workstation and enterprise server environments. Please refer to our web site (http://www.supermicro.com/products/) for updates on supported processors. This product is intended to be installed and serviced by professional technicians.

Manual Organization

Chapter 1 describes the features, specifications and performance of the mainboard and provides detailed information about the chipset.

Chapter 2 provides hardware installation instructions. Read this chapter when installing the processor, memory modules and other hardware components into the system. If you encounter any problems, see **Chapter 3**, which describes troubleshooting procedures for video, memory and system setup stored in the CMOS.

Chapter 4 includes an introduction to BIOS and provides detailed information on running the CMOS Setup utility.

Appendix A lists BIOS Error Beep Codes.

Appendix B and Appendix C provide the Windows OS and other software installation instructions.

Conventions Used in the Manual:

Special attention should be given to the following symbols for proper installation and to prevent damage done to the components or injury to yourself:

Danger/Caution: Instructions to be strictly followed to prevent catastrophic system failure or to avoid bodily injury

Warning: Important information given to prevent faulty installation and to avoid damage to the motherboard and the components

Note: Additional Information given to ensure proper component installation and correct system setup

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Chapter 1
Introduction

1-1 Overview

Checklist

Congratulations on purchasing your computer motherboard from an acknowledged leader in the industry. Supermicro boards are designed with the utmost attention to detail to provide you with the highest standards in quality and performance. Check that the following items have all been included with your motherboard. If anything listed here is damaged or missing, contact your retailer.

All the following items are included in the retail box.

One (1) Supermicro Mainboard

One (1) ribbon cable for IDE devices (CBL-036L-03)

One (1) floppy ribbon cable (CBL-022L)

Six (6) SATA cables (CBL-044L)

One (1) I/O backpanel shield (MCP-260-74301-0N)

One (1) Heatsink Mounting Backplate (SKT 0159L)

One (1) Supermicro CD containing drivers and utilities (CDR-X7)

One (1) User's/BIOS Manual

Contacting Supermicro

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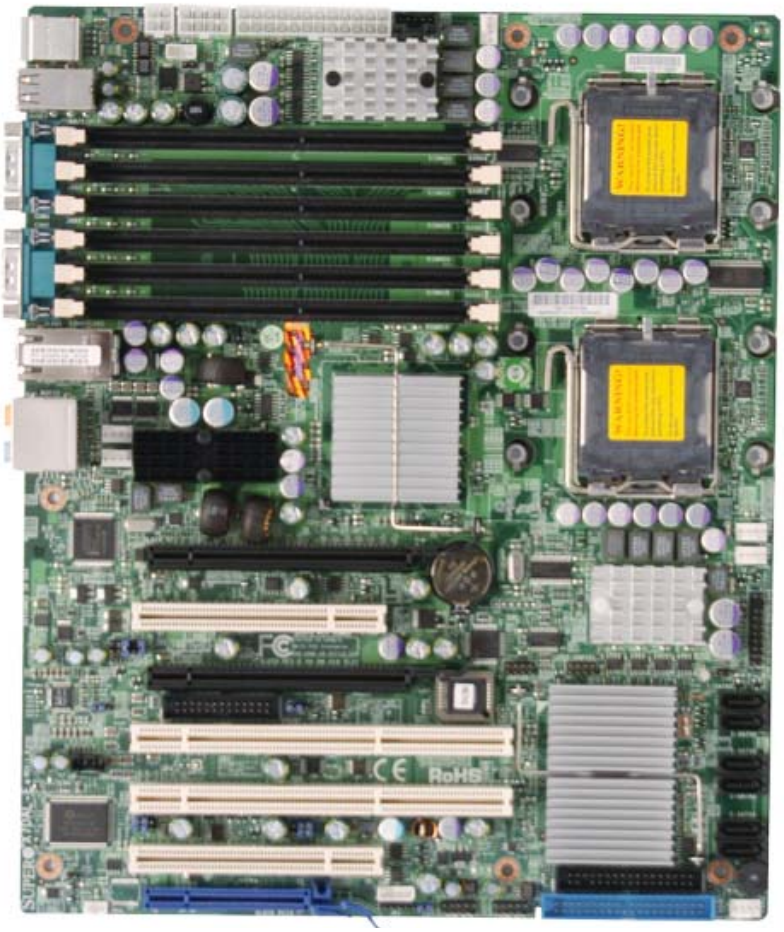
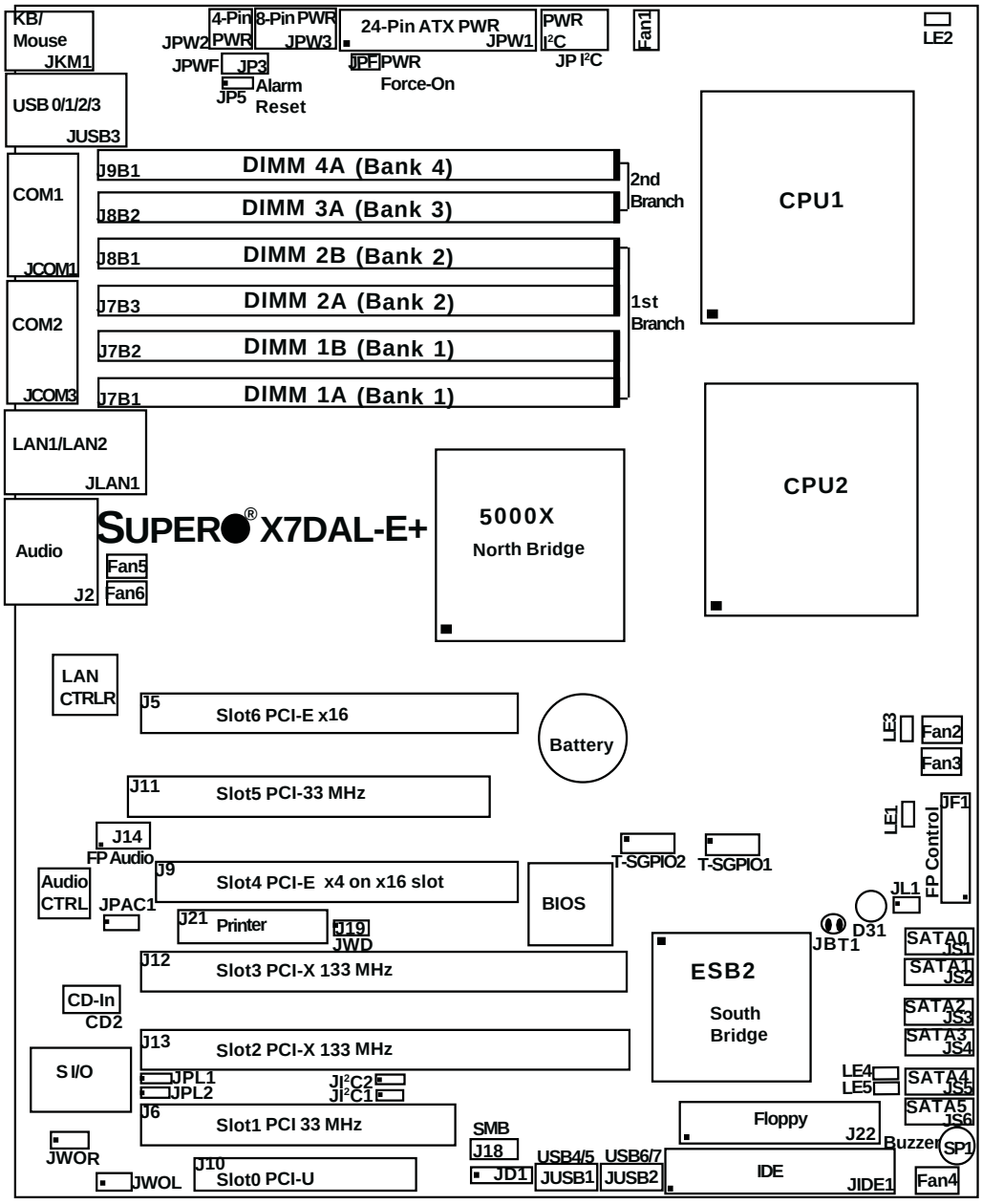
SUPER® X7DAL-E+ Image



Note: The drawings and pictures shown in this manual were based on the latest PCB Revision available at the time of publishing of the manual. The motherboard you've received may or may not look exactly the same as the graphics shown in the manual.

SUPER® X7DAL-E+ Motherboard Layout

(not drawn to scale)



Notes:

1. Jumpers not indicated are for test purposes only.
2. "■" indicates the location of Pin 1.
3. When D31 is on, make sure to unplug the power cable before removing or installing components.
4. When the Amber light is on for LE2, it indicates CPU1 VRM overheat. If the Amber light is on for LE3, it indicates CPU2 VRM overheat.
5. The drawings and pictures shown in this manual were based on the latest PCB Revision available at the time of publishing of the manual. The motherboard you've received may or may not look exactly the same as the graphics shown in the manual.

Quick Reference (X7DAL-E+) (See Chapter 2 for details)

Jumper	Description	Default Setting
JBT1	CMOS Clear	See Chapter 2
JI^{2}C1/JI^{2}C2	SMB to PCI Slot#1/Slot#2 Speed	Pins 2-3 (Disabled)
JPAC1	Audio Enable	Pins 1-2 (Enabled)
JPF	PWR Force-On	Off (Normal)
JPL1/ JPL2	GLAN1/GLAN2 Enable	Pins 1-2 (Enabled)
JWD (J19)	Watch Dog	Pins 1-2 (Reset)

Connector	Description
ATX PWR (JPW1)	Primary 24-Pin ATX PWR Connector
CPU PWR/PCI-E PWR	+12V 8-pin CPU PWR/+12V 4-pin PCI-Exp. PWR
Alarm Reset	Alarm Reset (JP5) Header
Audio (J2)	High Definition Audio Microphone, Line-In/Line-Out
CD-In (CD2)	CD-In
Buzzer (SP1)	Internal Speaker
Chassis Intru.(JL1)	Chassis Intrusion Header
COM1/COM2 (JCOM1/3)	COM1/COM2 Serial Port Connectors
Fans 1-6	System cooling fans, chassis fans, CPU fans
Floppy (J22)	Floppy Disk Drive Connector
FP Audio (J14)	Front Panel Audio Connector
FP Control (JF1)	Front Control Panel Connector
IDE1 (JIDE1)	IDE1 Hard Drive
Keyboard/Mouse (JKM1)	Keyboard/Mouse Connectors
LAN 1/2 (JLAN1)	G-bit LAN Ethernet Ports
Printer (J21)	Parallel (Printer) Port
PWR LED/SPKR (JD1)	Power LED(pins1-3)/Speaker (pins 4-7)
PWR SMB (JPI^{2}C)	Power System Management (I^{2}C) Header
PWR Supply Fail Detect	PWR Supply Failure Detection Connector (JPWF:JP3)
I-SATA0-SATA5 (JS1-JS6)	Intel SATA 0-5 Connectors
SGPIO1/2 (T-SGPIO1/2)	Serial General Purpose Input/Output Headers
Slot#0 (PCI-U)	PCI-U Slot
SMB (J18)	System Management Bus Header
USB 0/1/2/3 (JUSB3)	Back Panel USB 0/1/2/3
USB 4/5/6/7 (JUSB1/2)	Front Panel USB 4/5 (JUSB1)/FPUSB 6/7 (JUSB2)
WOL (JWOL1)	Wake-on-LAN Header
WOR (JWOR)	Wake-on-Ring Header

LED Indicator	Description
D31(*Note 4 on Pg. 1-4)	Status LED (See Chapter 2)
LE1	Power LED
LE2/LE3 (*Note 5 on 1-4)	CPU1 VRM Overheat(LE2)/CPU2 VRM Overheat (LE3)
LE4/LE5	POST LED Indicators (See Chapter 2)

Motherboard Features

CPU

- Dual Intel® 64-bit LGA 771 Quad-Core/Dual-Core Xeon 5300/5100/5000 Series processors at a front side bus speed of 1.333 GHz/1.066 GHz/667 MHz

Memory

- Six 240-pin DIMM sockets with support up to 24 GB ECC FBD (Fully Buffered) DDR2 667/533 Memory (*See Section 2-3 in Chapter 2 for DIMM Slot Population.)

Chipset

- Intel 5000X chipset, including: the 5000X Memory Control Hub (MCH) and the Enterprise South Bridge 2 (ESB2)

Expansion Slots

- Two PCI-E slots (one x16: Slot#6, one x16 slot with x4 signal: Slot#4)
- Two 64-bit PCI-X 133 MHz slots (Slot#2/Slot#3)
- Two 32-bit PCI 33 MHz slots (Slot#1/Slot#5)
- One PCI-U Slot: PCI-U slot (Slot#0) (*For Supermicro's add-on expansion card.)

BIOS

- 8 Mb Phoenix® Flash ROM
- DMI 2.3, PCI 2.2, ACPI 1.0, Plug and Play (PnP), USB Keyboard support, Hardware BIOS Virus Protection and SMBIOS 2.3

PC Health Monitoring

- Onboard voltage monitors for CPU cores, +1.8V, +3.3V, +5V, +12V, –12V, +3.3V standby, +5V standby and VBAT)
- Fan status monitor with firmware control
- CPU/chassis temperature monitors
- Low noise fan speed control
- Platform Environment Control Interface (PECI) ready
- CPU fan auto-off in sleep mode
- Pulse Width Modulation (PWM) fan control
- I^2C temperature sensing logic
- Thermal Monitor 2 (TM2) support
- CPU slow-down on temperature overheat
- CPU thermal trip support for processor protection
- Power-up mode control for recovery from AC power loss
- Chassis intrusion detection
- System resource alert via Supero Doctor III

ACPI Features

- Slow blinking LED for suspend state indicator
- Main switch override mechanism
- ACPI Power Management (S1, S3, S4, S5)
- Power-on mode for power recovery

Onboard I/O

- Six SATA ports (supporting RAID 0,1, 10 and 5*) (For the Windows OS only)
- One PCI-U Universal slot
- Intel GLAN Controller (82563EB) with two Giga-bit LAN ports supported by the ESB 2 South Bridge
- One EIDE Ultra DMA/100 bus master interface
- One floppy port interface
- One COM port/one header
- One EPP/ECP Parallel Header
- Up to eight USB 2.0 (Universal Serial Bus) (4 ports, 4 Headers)
- Super I/O: Winbond W83627HF
- High Definition Audio
- PS/2 Keyboard and mouse

Other

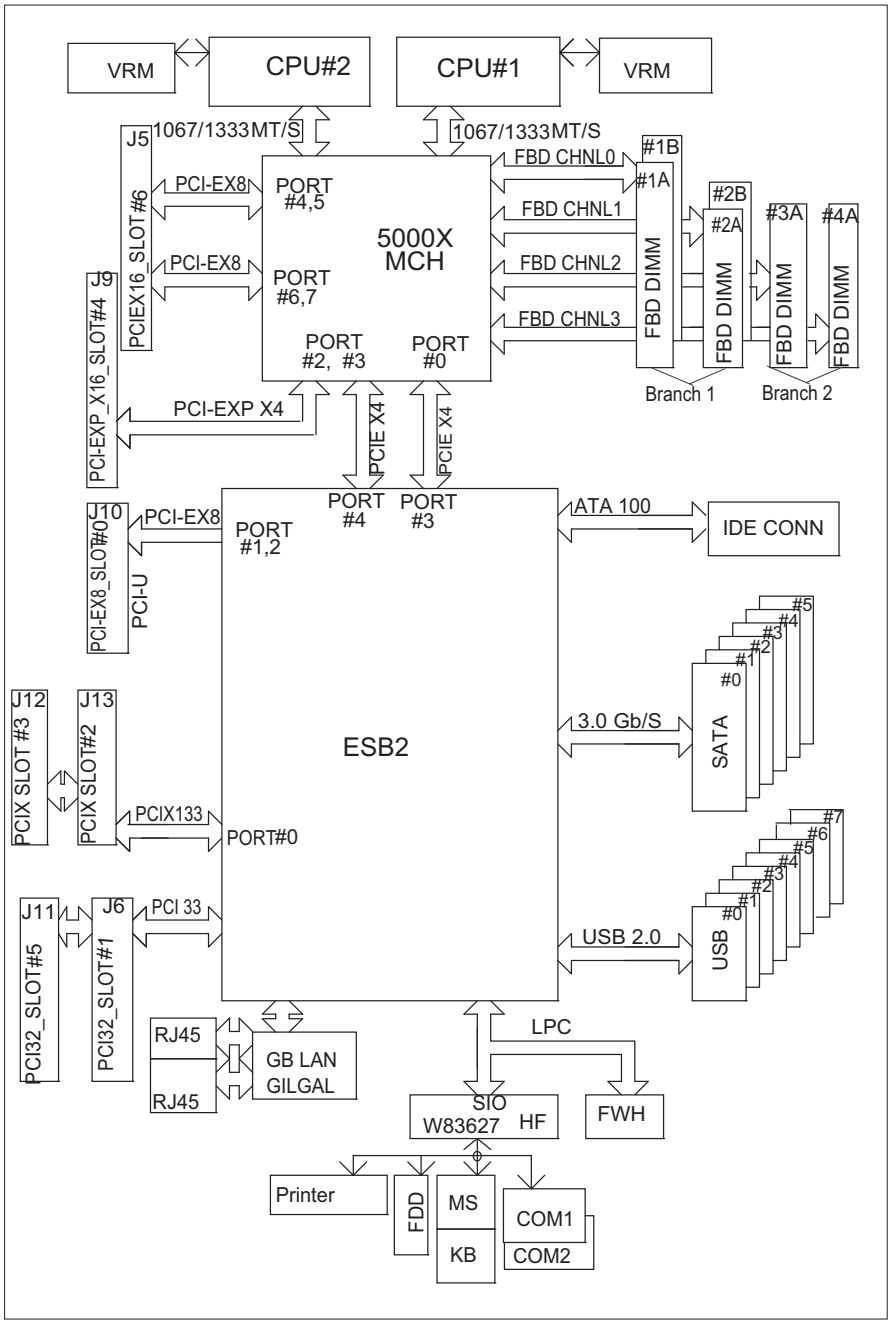
- External modem ring-on
- Wake-on-LAN (WOL)
- Wake-on-Ring (WOR)
- Console redirection
- Onboard Fan Speed Control by Thermal Management via BIOS

CD/Diskette Utilities

- BIOS flash upgrade utility and device drivers

Dimensions

- ATX 12" (L) x 10" (W) (304.8mm x 254 mm)



Block Diagram of the 5000X Chipset

Note: This is a general block diagram. Please see the previous Motherboard Features pages for details on the features of the motherboard.

1-2 Chipset Overview

Built upon the functionality and the capability of the 5000X chipset, the X7DAL-E+ motherboard provides the performance and feature set required for dual processor-based workstations with configuration options optimized for communications, presentation, storage and computation applications or for use as workstations. The 5000X chipset supports a single or two Xeon 64-bit Dual-Core or Quad-Core processor(s) with front side bus speeds of up to 1333 MHz. The chipset consists of the 5000X Memory Controller Hub (MCH), and the Enterprise South Bridge 2 (ESB2).

The 5000X MCH chipset is designed for symmetric multiprocessing across two independent front side bus interfaces. Each front side bus uses a 64-bit wide, 1.333 GHz data bus. The MCH chipset connects supports Fully Buffered DIMM modules, providing a total memory of up to 24.0 GB. In addition, the 5000X chipset offers a wide range of RAS features, including memory interface ECC, x4/x8 Single Device Data Correction, CRC, parity protection, memory mirroring and memory sparing.

The Xeon Dual-Core and Quad-Core Processor Features

Designed to be used with conjunction of the 5000X chipset, the Xeon Quad-Core/ Quad-Core Processor provides a feature set as follows:

The Xeon Dual Core Processors

*L1 Cache Size: Instruction Cache (32KB/16KB), Data Cache (32KB/24KB)

*L2 Cache Size: 4MB (2MB per core)

*Data Bus Transfer Rate: 8.5 GB/s

*Package: FC-LGA6/FC-LGA4, 771 Lands

The Xeon Quad Core Processors

*L1 Cache Size: Instruction Data Cache (32KB per core)

*L2 Cache Size: Shared 4MB per die (8MB Total Cache per processor)

*Data Bus Transfer Rate: 8.5 GB/s

1-3 Special Features

Recovery from AC Power Loss

The feature allows the user to set the power state after a power outage. You can select Power-Off for the system power to remain off after a power loss. Select Power-On for the system power to be turned on after a power loss. Select Last State to allow the system to resume its last state before the power loss. The default setting is **Last State**.

1-4 PC Health Monitoring

This section describes the PC health monitoring features of the X7DAL-E+. All have an onboard System Hardware Monitor chip that supports PC health monitoring.

Onboard Voltage Monitors for the CPU Cores, Chipset Voltage, +1.8V, +3.3V, +5V, +12V, -12V, +3.3V Standby, +5V Standby and VBAT.

An onboard voltage monitor will scan these voltages continuously. Once a voltage becomes unstable, a warning is given or an error message is sent to the screen. Users can adjust the voltage thresholds to define the sensitivity of the voltage monitor.

Fan Status Monitor with Firmware Control

The PC health monitor can check the RPM status of the cooling fans. The onboard CPU and chassis fans are controlled by Thermal Management via BIOS (under Hardware Monitoring in the Advanced Setting).

Environmental Temperature Control

The thermal control sensor monitors the CPU temperature in real time and will turn on the thermal control fan whenever the CPU temperature exceeds a pre-defined threshold. The overheat circuitry runs independently from the CPU. Once it detects that the CPU temperature is too high, it will automatically turn on the thermal fan control to prevent any overheat damage to the CPU. The onboard chassis thermal circuitry can monitor the overall system temperature and alert users when the chassis temperature is too high. (**Note:** This function is not available for the Quad-Core Processors.)

System Resource Alert

This feature is available when used with Supero Doctor III in the Windows OS environment or used with Supero Doctor II in Linux. Supero Doctor is used to notify the user of certain system events. For example, you can also configure Supero Doctor to provide you with warnings when the system temperature, CPU temperatures, voltages and fan speeds exceed a pre-defined range.

1-5 ACPI Features

ACPI stands for Advanced Configuration and Power Interface. The ACPI specification defines a flexible and abstract hardware interface that provides a standard way to integrate power management features throughout a PC system, including its hardware, operating system and application software. This enables the system to automatically turn on and off peripherals such as CD-ROMs, network cards, hard disk drives and printers. This also includes consumer devices connected to the PC such as VCRs, TVs, telephones and stereos.

In addition to enabling operating system-directed power management, ACPI provides a generic system event mechanism for Plug and Play and an operating system-independent interface for configuration control. ACPI leverages the Plug and Play BIOS data structures while providing a processor architecture-independent implementation that is compatible with Windows 2000, Windows XP, Windows 2003 Server and Windows Vista Operating Systems.

Slow Blinking LED for Suspend-State Indicator

When the CPU goes into a suspend state, the chassis power LED and LE1 will start blinking to indicate that the CPU is in suspend mode. When the user presses any key, the CPU will wake-up and the LED will automatically stop blinking and remain on.

Main Switch Override Mechanism

When an ATX power supply is used, the power button can function as a system suspend button to make the system enter a SoftOff state. The monitor will be suspended and the hard drive will spin down. Pressing the power button again will cause the whole system to wake-up. During the SoftOff state, the ATX power supply provides power to keep the required circuitry in the system alive. In case the system malfunctions and you want to turn off the power, just press and hold the power button for 4 seconds. This option can be set in the Power section of the BIOS Setup routine.

External Modem Ring-On

Wake-up events can be triggered by a device such as the external modem ringing when the system is in Standby or Off state. Note that external modem ring-on can only be used with an ATX 2.01 (or above) compliant power supply.

Wake-On-LAN (WOL)

Wake-On-LAN is defined as the ability of a management application to remotely power up a computer that is powered off. Remote PC setup, updates and asset tracking can occur after hours and on weekends so that daily LAN traffic is kept to a minimum and users are not interrupted. The motherboard has a 3-pin header (WOL) to connect to the 3-pin header on a Network Interface Card (NIC) that has

WOL capability. In addition, an onboard LAN controller can also support WOL without any connection to the WOL header. The 3-pin WOL header is to be used with a LAN add-on card only.

Note: Wake-On-LAN requires an ATX 2.01 (or above) compliant power supply.

1-6 Power Supply

As with all computer products, a stable power source is necessary for proper and reliable operation. It is even more important for processors that have high CPU clock rates.

The X7DAL-E+ can only accommodate 24-pin ATX power supply. Although most power supplies generally meet the specifications required by the motherboard, some are inadequate. You should use one that will supply at least 400W of power. In addition, the 12V 8-pin and 4-pin power connectors are also required for adequate power supply to the system. Also your power supply must supply 1.5A for the Ethernet ports.

It is strongly recommended that you use a high quality power supply that meets ATX power supply Specification 2.02 or above. It must also be SSI compliant (info at http://www.ssiforum.org/). Additionally, in areas where noisy power transmission is present, you may choose to install a line filter to shield the computer from noise. It is recommended that you also install a power surge protector to help avoid problems caused by power surges.

1-7 Super I/O

The disk drive adapter functions of the Super I/O chip include a floppy disk drive controller that is compatible with industry standard 82077/765, a data separator, write pre-compensation circuitry, decode logic, data rate selection, a clock generator, drive interface control logic and interrupt and DMA logic. The wide range of functions integrated onto the Super I/O greatly reduces the number of components required for interfacing with floppy disk drives. The Super I/O supports 360 K, 720 K, 1.2 M, 1.44 M or 2.88 M disk drives and data transfer rates of 250 Kb/s, 500 Kb/s or 1 Mb/s. It also provides two high-speed, 16550 compatible serial communication ports (UARTs). Each UART includes a 16-byte send/receive FIFO, a programmable baud rate generator, complete modem control capability and a processor interrupt system. Both UARTs provide legacy speed with baud rate of up to 115.2 Kbps as well as an advanced speed with baud rates of 250 K, 500 K, or 1 Mb/s, which support higher speed modems.

The Super I/O supports one PC-compatible printer port (SPP), Bi-directional Printer Port (BPP) , Enhanced Parallel Port (EPP) or Extended Capabilities Port (ECP).

The Super I/O provides functions that comply with ACPI (Advanced Configuration and Power Interface), which includes support of legacy and ACPI power management through an SMI or SCI function pin. It also features auto power management to reduce power consumption.

Notes

Chapter 2
Installation

2-1 Static-Sensitive Devices

Electro-Static-Discharge (ESD) can damage electronic components. To prevent damage to your system board, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Handle the board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.
- Use only the correct type of onboard CMOS battery as specified by the manufacturer. Do not install the onboard battery upside down to avoid possible explosion.

Unpacking

The motherboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

2-2 Processor and Heatsink Installation

When handling the processor package, avoid placing direct pressure on the label area of the fan.

Notes: 1. Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket before you install the CPU heatsink.

2. Intel's boxed Xeon CPU package contains the CPU fan and heatsink assembly. If you buy a CPU separately, make sure that you use only Intel-certified multi-directional heatsink and fan.

3. Make sure to install the Heatsink Backplate and the motherboard into the chassis before you install the CPU heatsink and fan. (See Installation Procedures below.)

4. When purchasing a motherboard with an LGA 771 CPU Socket, make sure that the CPU plastic cap is in place and none of the CPU Socket pins are bent; otherwise, contact the retailer immediately.

5. Refer to the MB Features Section for more details on CPU support.

Installation Procedures

For proper system setup, please follow the procedure below to install the CPU, backplate, heatsink, and motherboard into the chassis.

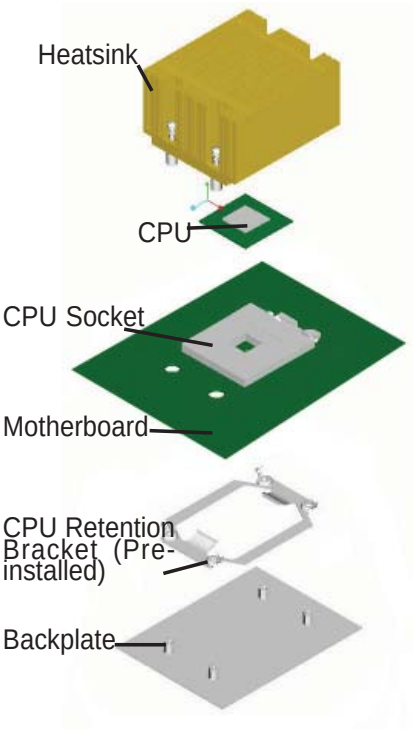
1. Install the heatsink backplate onto the chassis.

2. Install the motherboard into the chassis.

3. Install the CPU onto the motherboard.

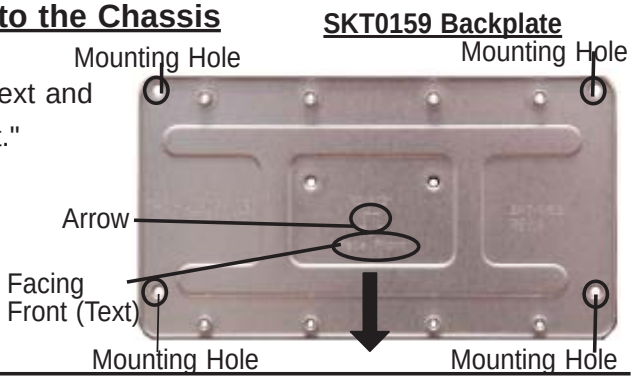
4. Install the heatsink or/and cooling fans (if any).

5. Connect fan and power cables (if any).



Mounting the Backplate onto the Chassis

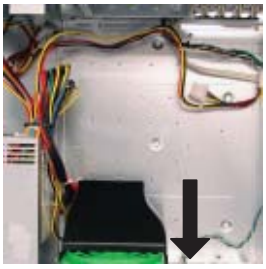
1. On the backplate, locate the text and the arrow, indicating "facing front."



2. Locate the front side of the chassis.

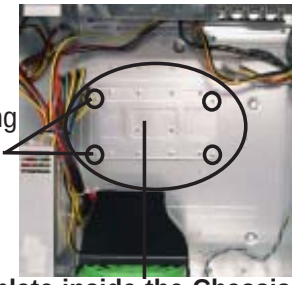
3. Locate the four backplate mounting holes on the chassis.

4. Align the backplate with the chassis. Make sure that the arrow on the backplate is pointing at the front side of the chassis.



The Front Side of Chassis

5. Once the backplate is correctly oriented, align the four heatsink mounting holes on the backplate against their respective mounting holes on the chassis. (***Note**: The two mounting holes on the center of the backplate are optional.)



Backplate inside the Chassis (w/Mounting holes aligned)

6. Once aligned, securely attach the backplate onto the chassis by installing the screws into the mounting holes.

Mounting the Motherboard into the Chassis

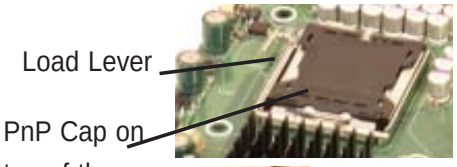
All motherboards have standard mounting holes to fit different types of chassis. Make sure that the locations of all the mounting holes for both motherboard and chassis match. Make sure that the metal standoffs click in or are screwed in tightly. Then, use a screwdriver to secure the motherboard onto the motherboard tray.

Mounting MB into the Chassis

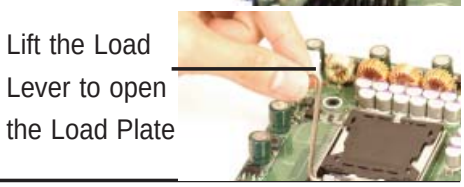
Note: some components are very close to the mounting holes. Please take precautionary measures to prevent any damage done to these components when you install the motherboard onto the chassis.

Installing the LGA771 Processor

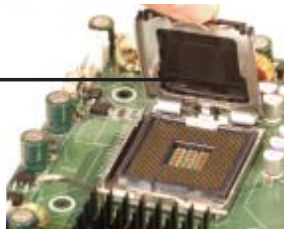
1. Press the load lever to release the load plate, which covers the CPU socket, from its locking position.



2. Gently lift the load lever to open the load plate.



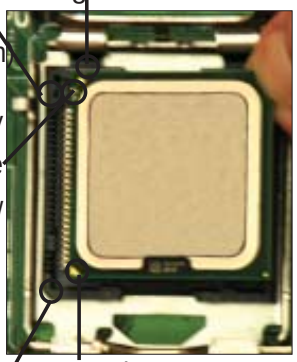
3. Use your thumb and index finger to hold the CPU at the North Center Edge and the South Center Edge of the CPU.



4. Align CPU Pin1 (the CPU corner marked with a triangle) against the socket corner that is marked with a triangle cutout.

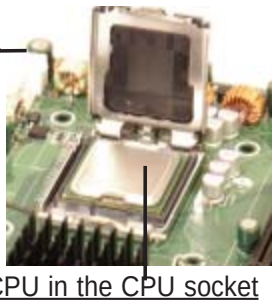
5. Align the CPU key that is the semi-circle cutout below a gold dot against the socket key, the notch on the same side of the triangle cutout on the socket.

6. Once aligned, carefully lower the CPU straight down to the socket. (**Do not drop the CPU on the socket. Do not move the CPU horizontally or vertically. Do not rub the CPU against the surface or against any pins of the socket to avoid damage done to the CPU or the socket.)

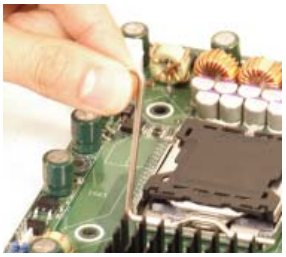


7. With the CPU inside the socket, inspect the four corners of the CPU to make sure that the CPU is properly installed. Then, close the load plate.

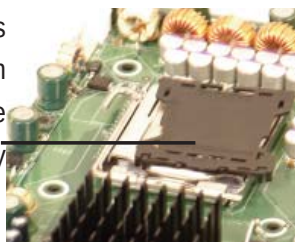
8. Use your thumb to gently push the load lever down to lock it.



9. If the CPU is properly installed into the socket, the plastic cap will be automatically released from the load plate when the clip is pushed in the clip lock. Remove the plastic cap from the motherboard.



(**Warning**: Please save the plastic PnP cap. The motherboard must be shipped with the PnP cap properly installed to protect the CPU socket pins. Shipment without the PnP cap properly installed will cause damage to the socket pins.)



Installing and Removing the Heatsink

CEK Heatsink Installation

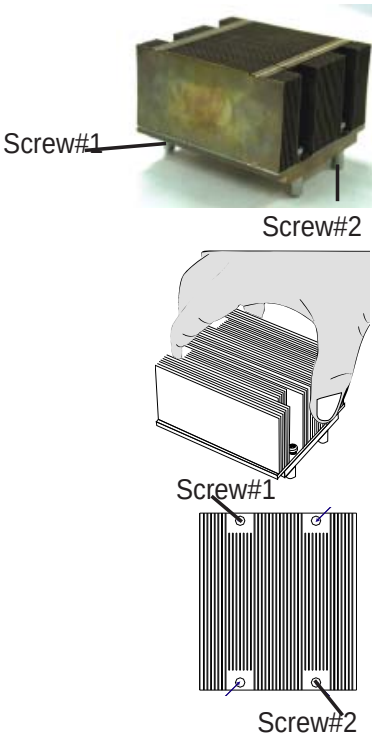
1. Do not apply any thermal grease to the heatsink or the CPU die; the required amount has already been applied.

2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the retention mechanism.

3. Screw in two diagonal screws (ie the #1 and the #2 screws) until just snug (-do not over-tighten the screws to avoid possible damage to the CPU.)

4. Finish the installation by fully tightening all four screws.

CEK Passive Heatsink



Removing the Heatsink

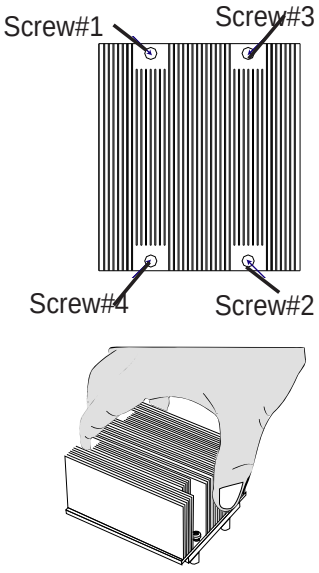
Warning: We do not recommend that the CPU or the heatsink be removed. However, if you do need to uninstall the heatsink, please follow the instructions on the next page to uninstall the heatsink to prevent damaging the CPU or the CPU socket.

1. Unscrew and remove the heatsink screws from the motherboard in the sequence as show in the picture on the right.

2. Hold the heatsink as shown in the picture on the right and gently wriggle the heatsink to loosen it from the CPU. (Do not use excessive force when wriggling the heatsink!!)

3. Once the heatsink is loosened, remove it from the CPU socket.

4. Clean the surface of the CPU and the heatsink to get rid of the old thermal grease. Reapply the proper amount of thermal grease on the surface before you re-install the CPU and the heatsink.



2-3 Installing DIMMs

Note: Check the Supermicro web site for recommended memory modules.

CAUTION

Exercise extreme care when installing or removing DIMM modules to prevent any possible damage. Also note that the memory is interleaved to improve performance (See step 1).

DIMM Installation

1. Insert the desired number of DIMMs into the memory slots, starting with DIMM #1A. The memory scheme is interleaved, so you must install two modules at a time, beginning with DIMM #1A, then DIMM #2A and so on. For optimal performance, please install memory modules in both Branch1 and Branch 2 (4 modules maximum.) (See the Memory Installation Table Below.)
2. Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to prevent inserting the DIMM module incorrectly.
3. Gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules (see step 1 above).

Memory Support

The X7DAL-E+ supports up to 24 GB fully buffered (FBD) ECC DDR2 667/533 in 6 DIMMs. Populating DIMM slots with pairs of memory modules of the same size and same type will result in Interleaved Memory which will increase memory performance.

Note 1: Due to OS limitations, some operating systems may not show more than 4 GB of memory. (See the DIMM Population Configurations Table below.)

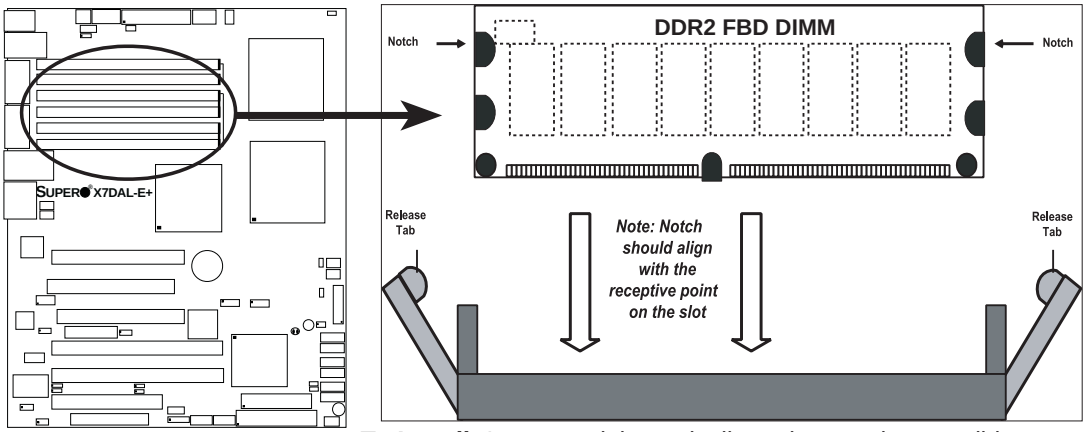
Optimized DIMM Population Configurations								
	Branch 1				Branch 2			
Number of DIMMs	Bank 1 (Channel 0)		Bank 2 (Channel 1)		Bank 3 (Channel 2)		Bank 4 (Channel 3)	
2 DIMMs	1A	------	2A	------	------	N/A	------	N/A
4 DIMMs	1A	------	2A	------	3A	N/A	4A	N/A
6 DIMMs	1A	1B	2A	2B	3A	N/A	4A	N/A

(***Notes:* i.** DIMM slot# specified: DIMM slot to be populated; "---": DIMM slot not to be populated. **ii.** Both FBD 533 MHz and 667MHz DIMMs are supported; however, you need to use the memory modules of the same speed and of the same type on a motherboard. **iii.** Interleaved memory is supported when pairs of DIMM modules are installed. To optimize memory performance, please install pairs of memory in **both Branch 1 and Branch 2**. **iv.** For memory to work properly, you need to follow the restrictions listed above.)

Note 2: Due to memory allocation to system devices, memory remaining available for operational use will be reduced when 4 GB of RAM is used. The reduction in memory availability is disproportional. (Refer to the Memory Availability Table for details.)

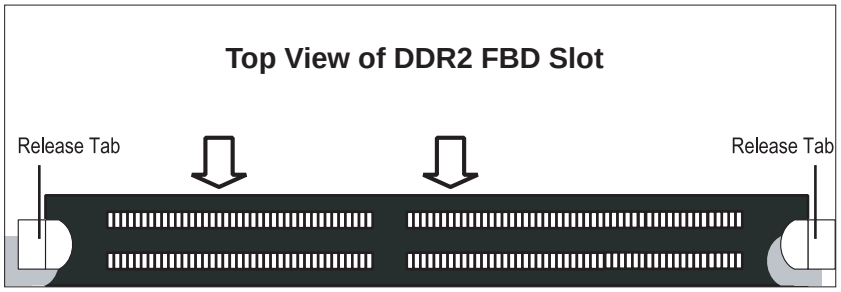
Possible System Memory Allocation & Availability		
System Device	Size	Physical Memory Remaining (-Available) (4 GB Total System Memory)
Firmware Hub flash memory (System BIOS)	1 MB	3.99
Local APIC	4 KB	3.99
Area Reserved for the chipset	2 MB	3.99
I/O APIC (4 Kbytes)	4 KB	3.99
PCI Enumeration Area 1	256 MB	3.76
PCI Express (256 MB)	256 MB	3.51
PCI Enumeration Area 2 (if needed) -Aligned on 256-MB boundary-	512 MB	3.01
VGA Memory	16 MB	2.85
TSEG	1 MB	2.84
Memory available to OS and other applications		2.84

Installing and Removing DIMMs



To Install: Insert module vertically and press down until it snaps into place. Pay attention to the alignment notch at the bottom.

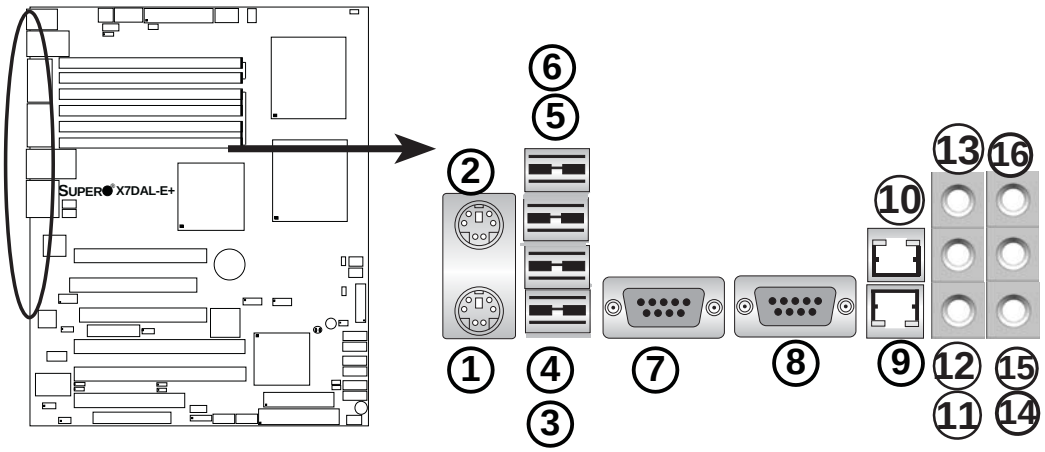
To Remove:
Use your thumbs to gently push the release tabs near both ends of the module. This should release it from the slot.



2-4 Control Panel Connectors/IO Ports

The I/O ports are color coded in conformance with the PC 99 specification. See the figure below for the colors and locations of the various I/O ports.

A. Back Panel Connectors/IO Ports



Back Panel I/O Port Locations and Definitions

Back Panel Connectors

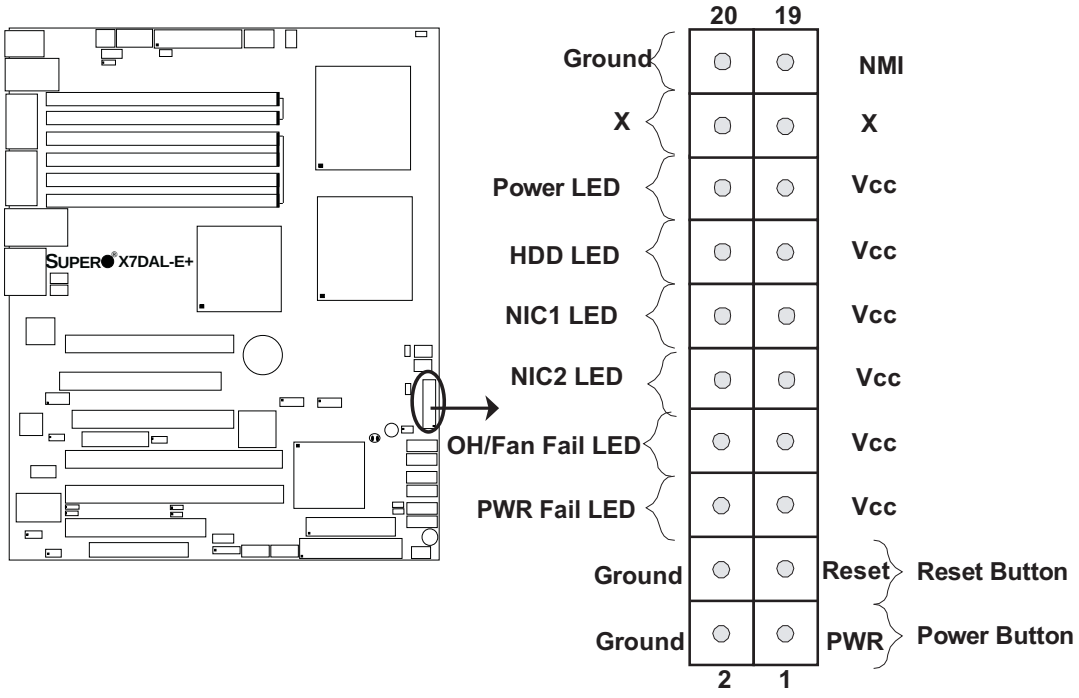
1. PS/2 Keyboard (Purple)
2. PS/2 Mouse (Green)
3. Back Panel USB Port 0
4. Back Panel USB Port 1
5. Back Panel USB Port 2
6. Back Panel USB Port 3
7. COM Port 1 (Turquoise)
8. COM Port 2 (Turquoise)
9. Gigabit LAN 2
10. Gigabit LAN 1
11. Side_Surround (Grey)
12. Back_Surround (Black)
13. CEN/LFE (Orange)
14. Microphone-In (Pink)
15. Front (Green)
16. Line-In (Blue)

*See Section 2-5 for details.)

B. Front Control Panel

JF1 contains header pins for various buttons and indicators that are normally located at a control panel at the front of the chassis. These connectors are designed specifically for use with Supermicro workstation chassis. See the figure below for the descriptions of the various control panel buttons and LED indicators. Refer to the following section for descriptions and pin definitions.

JF1 Header Pins



C. Front Control Panel Pin Definitions

NMI Button

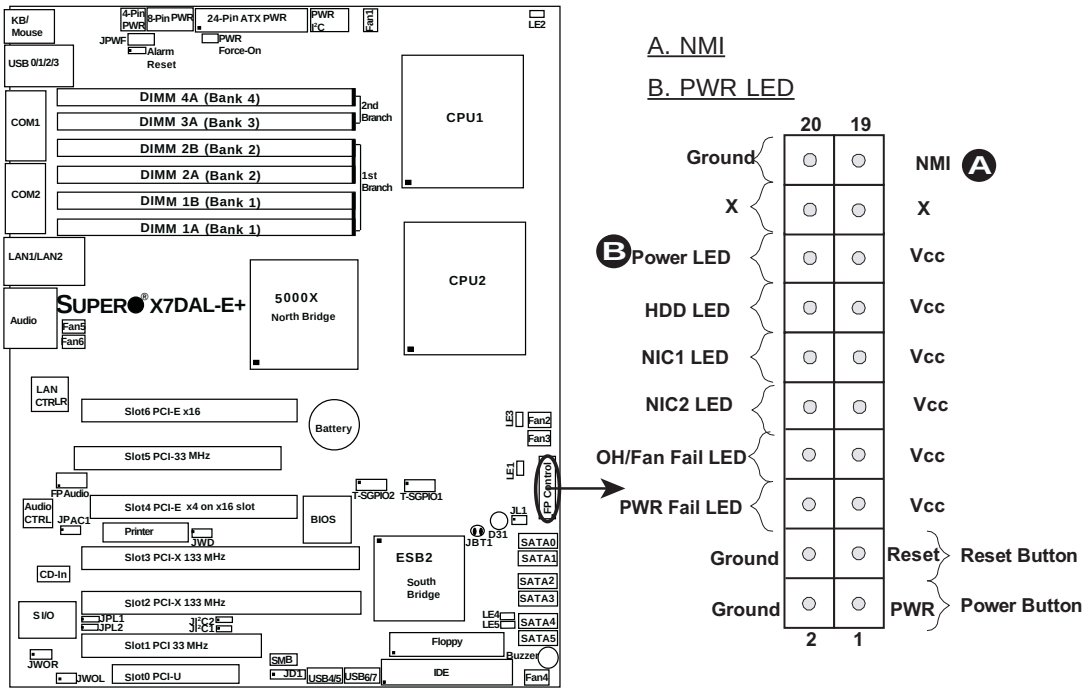
The non-maskable interrupt button header is located at pins 19 and 20 of JF1. Refer to the table on the right for pin definitions.

NMI Button Pin Definitions (JF1)	
Pin#	Definition
19	Control
20	Ground

Power LED

The Power LED connection is located at pins 15 and 16 of JF1. Refer to the table on the right for pin definitions.

Power LED Pin Definitions (JF1)	
Pin#	Definition
15	+5V
16	Ground



HDD LED

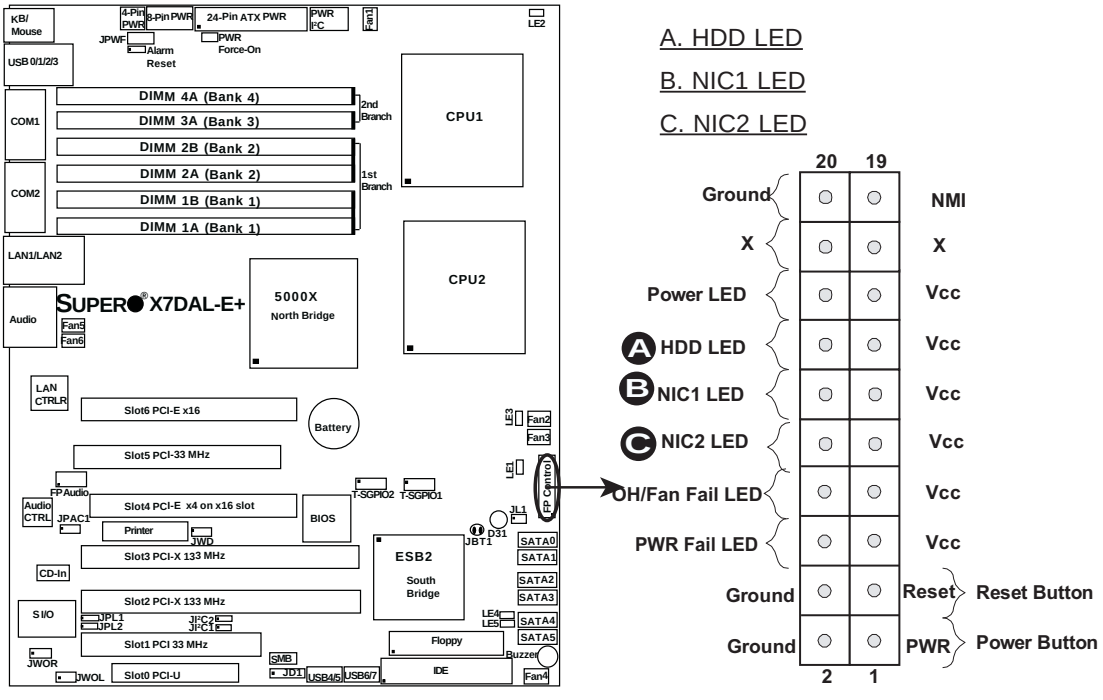
The HDD LED connection is located at pins 13 and 14 of JF1. Attach the hard drive LED cable here to display disk activity (for any hard drives on the system, including SAS, Serial ATA and IDE). See the table on the right for pin definitions.

HDD LED Pin Definitions (JF1)	
Pin#	Definition
13	+5V
14	HD Active

NIC1/NIC2 LED Indicators

The NIC (Network Interface Controller) LED connection for GLAN port1 is located at pins 11 and 12 of JF1 and the LED connection for GLAN Port2 is on Pins 9 and 10. Attach NIC LED cables to display network activity. Refer to the table on the right for pin definitions.

GLAN1/2 LED Pin Definitions (JF1)	
Pin#	Definition
9/11	Vcc
10/12	Ground



Overheat/Fan Fail LED (OH)

Connect an LED to the OH/Fan Fail connection on pins 7 and 8 of JF1 to provide advanced warning of chassis overheating or fan failure. Refer to the table on the right for pin definitions.

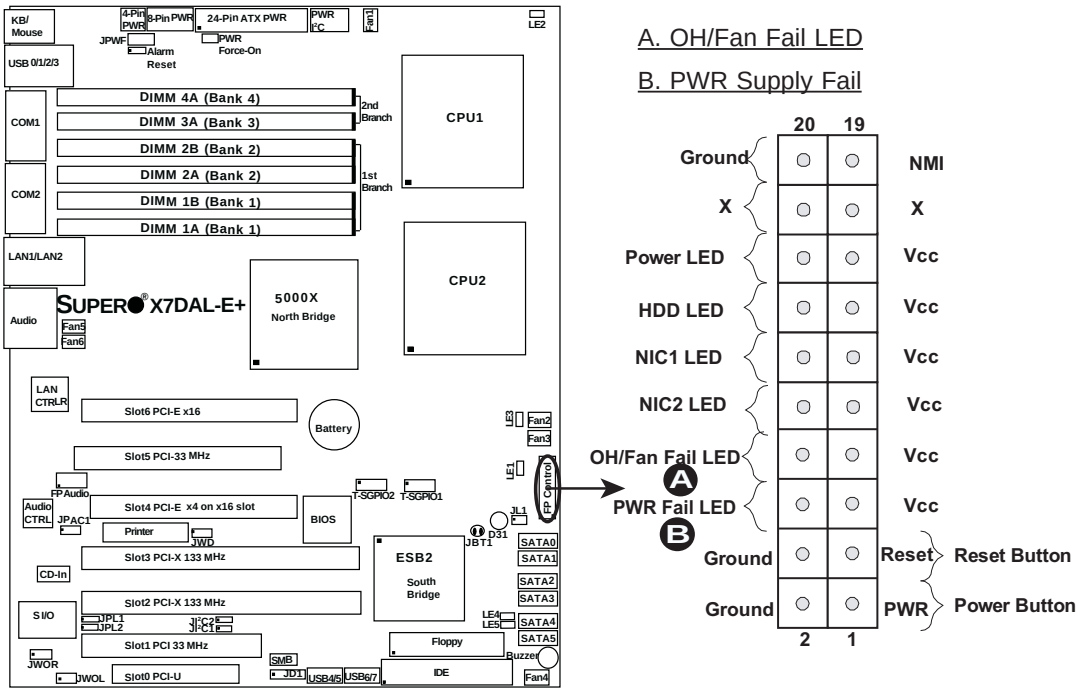
OH/Fan Fail LED Pin Definitions (JF1)	
Pin#	Definition
7	Vcc
8	Ground

OH/Fan Fail Indicator Status	
State	Definition
Off	Normal
On	Overheat
Flash-ing	Fan Fail

Power Fail LED

The Power Fail LED connection is located at pins 5 and 6 of JF1. Refer to the table on the right for pin definitions.

PWR Fail LED Pin Definitions (JF1)	
Pin#	Definition
5	Vcc
6	Ground



Reset Button

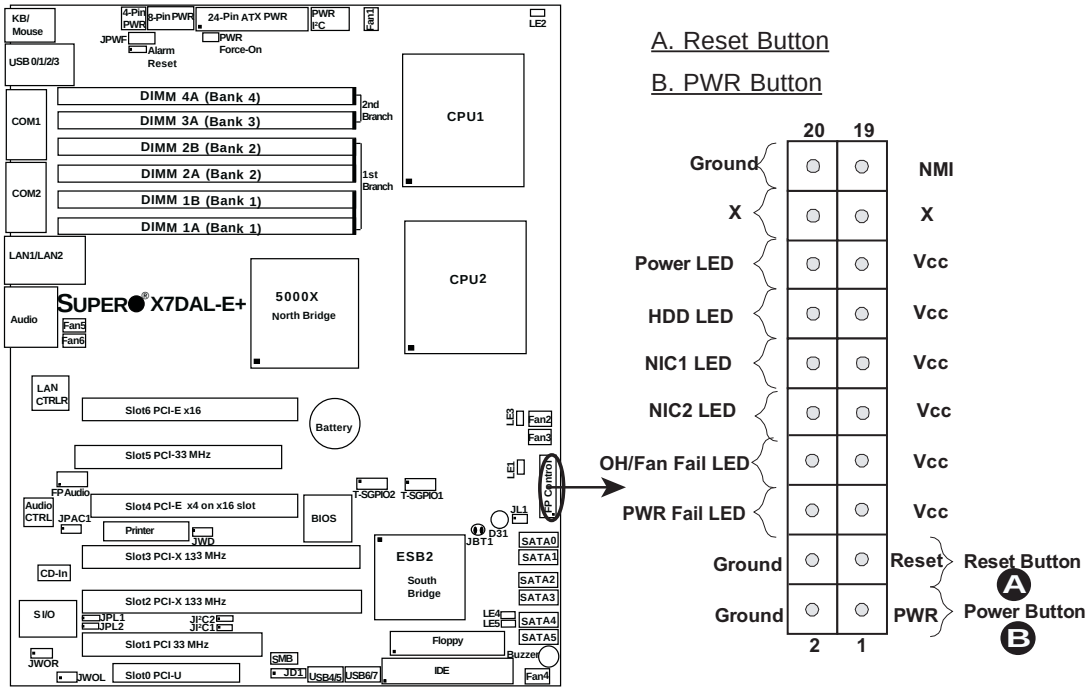
The Reset Button connection is located at pins 3 and 4 of JF1. Attach it to the hardware reset switch on the computer case. Refer to the table on the right for pin definitions.

Reset Button Pin Definitions (JF1)	
Pin#	Definition
3	Reset
4	Ground

Power Button

The Power Button connection is located at pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (with a setting in BIOS - see Chapter 4). To turn off the power when set to suspend mode, press the button for at least 4 seconds. Refer to the table on the right for pin definitions.

Power Button Pin Definitions (JF1)	
Pin#	Definition
1	Signal
2	+3V Standby



2-5 Connecting Cables

ATX Power Connector

A 24-pin main power supply connector(JPW1) and an 8-pin CPU PWR connector (JPW3) are located on the motherboard. These power connectors meet the SSI EPS 12V specification. The 4-pin 12V PWR supply at JPW2 is required to provide adequate power to the PCI-Express slots. See the tables on the right for pin definitions.

Processor Power Connector

In addition to the Primary ATX power connector (above), the 12V 8-pin CPU PWR connector at JPW3 must also be connected to your motherboard. See the table on the right for pin definitions.

ATX Power 20-pin Connector Pin Definitions

Pin#	Definition	Pin #	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res (NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

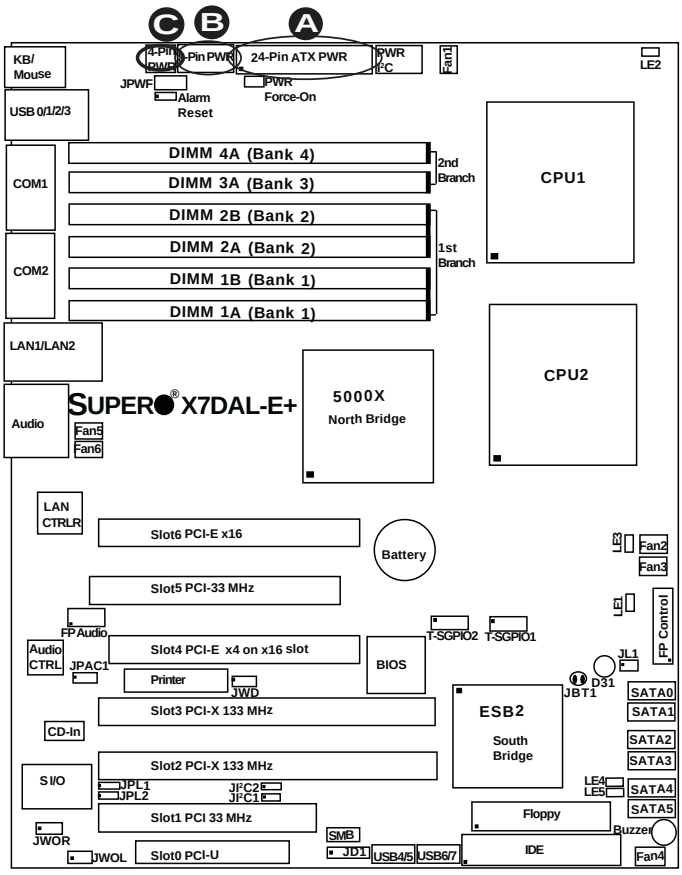
12V 4-pin Power Connector Pin Definitions

Pins	Definition
1 and 2	Ground
3 and 4	+12V

12V 8-pin Power CPU Connector Pin Definitions

Pins	Definition
1 through 4	Ground
5 through 8	+12V

Required Connection



A. 24-pin ATX PWR

B. 8-pin Processor PWR

C. 4-pin Processor PWR

Universal Serial Bus (USB)

There are eight USB 2.0 (Universal Serial Bus) ports/headers on the motherboard. Four of them are Back Panel USB ports (JUSB3: USB#0/#1/#2/#3), and the other four are Front Panel USB headers (JUSB1: USB#4/#5, JUSB2: USB#6/#7). See the tables on the right for pin definitions.

Back Panel USB (USB0/1/2/3)

Pin#	Definitions
1	+5V
2	PO-
3	PO+
4	Ground
5	N/A

Front Panel USB Pin Definitions (USB4/5/6/7)

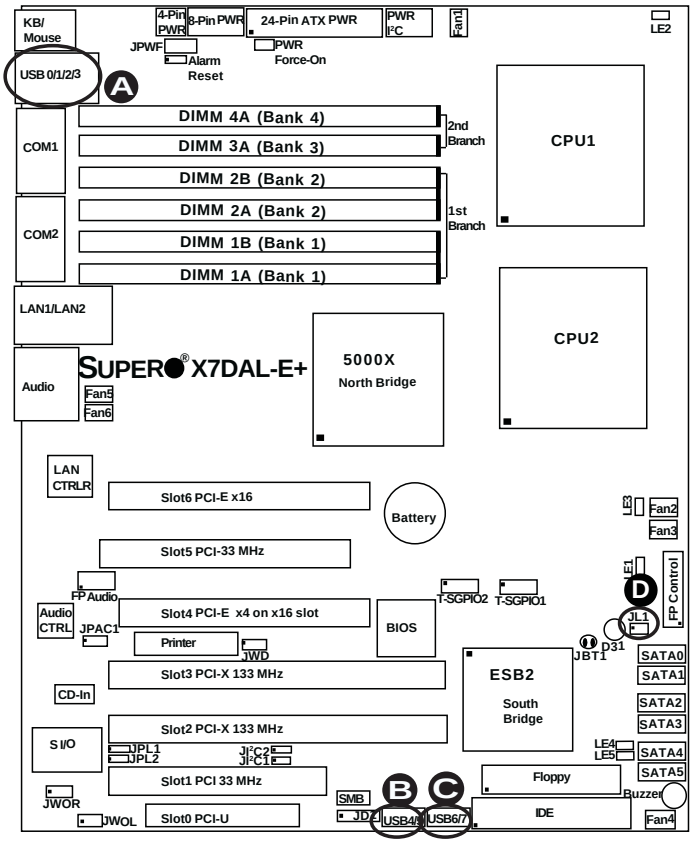
USB4		USB5	
Pin #	Definition	Pin #	Definition
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground
5	Key	5	No connection

Chassis Intrusion

A Chassis Intrusion header is located at JL1 on the motherboard. Attach the appropriate cable from the chassis to inform you of a chassis intrusion when the chassis is opened.

Chassis Intrusion Pin Definitions (JL1)

Pin#	Definition
1	Intrusion Input
2	Ground



A. Backpanel USB 0/1/2/3

B. Front Panel USB 4/5

C. Front Panel USB 6/7

D. Chassis Intrusion

Fan Headers

The X7DAL-E+ has six chassis/system fan headers (Fan1 to Fan6). (**Note**: all these fans are 4-pin fans. However, Pins 1-3 of the fan headers are backward compatible with the traditional 3-pin fans.) See the table on the right for pin definitions. (The onboard fan speeds are controlled by Thermal Management via BIOS Hardware Monitor in the Advanced Setting. The default setting is **Disabled**. When using Thermal Management setting, please use all 3-pin fans or all 4-pin fans on the motherboard.)

Fan Header Pin Definitions

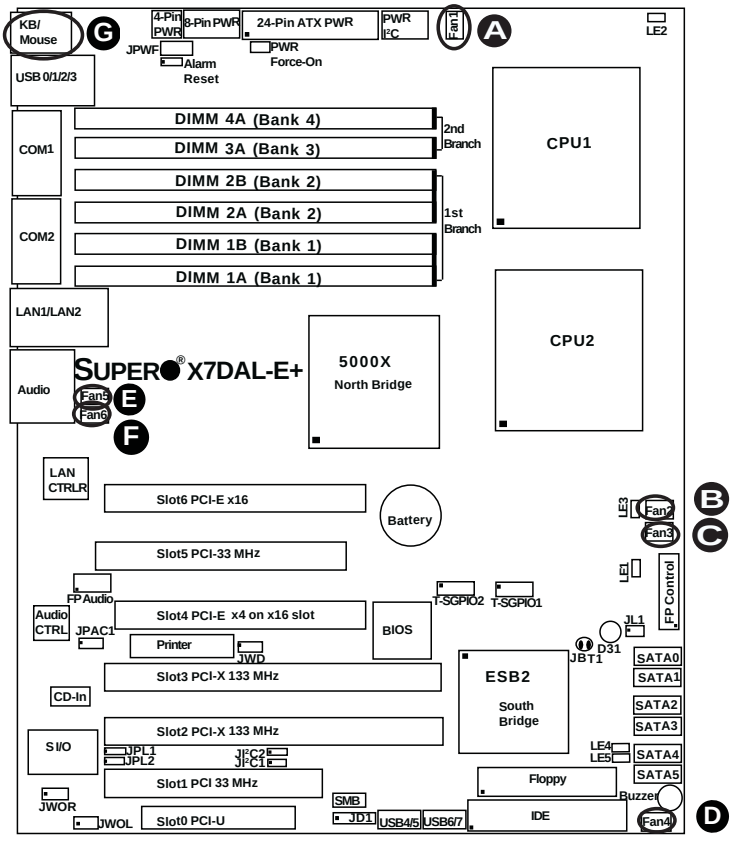
Pin#	Definition
1	Ground
2	+12V
3	Tachometer
4	PWR Modulation

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and the PS/2 mouse are located at JKM1. See the table on the right for pin definitions. (The mouse port is above the keyboard port.) See the table on the right for pin definitions.

PS/2 Keyboard and Mouse Port Pin Definitions

Pin#	Definition
1	Data
2	NC
3	Ground
4	VCC
5	Clock
6	NC



A. Fan 1
B. Fan 2
C. Fan 3
D. Fan 4
E. Fan 5
F. Fan 6
G PS/2 KB/Mouse

PWR Supply Failure/PWR Fault Detect (JPWF)

The system can notify you in the event of a power supply failure. This feature is available when three power supply units are installed in the chassis with one acting as a backup. If you only have one or two power supply units installed, you should disable this (the default setting) with JPWF to prevent false alarms.

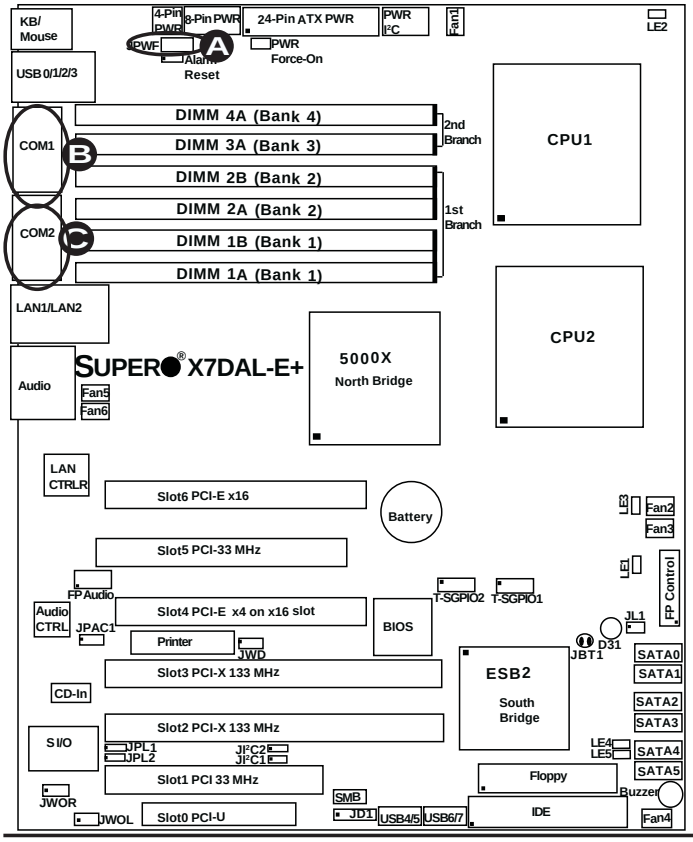
Note: This feature is only available when using Supermicro redundant power supplies.

PWR Supply Fail/PWR Fault (JPWF)	
Pin#	Definition
1	PWRF1
2	PWRF2
3	PWRF3
4	Alarm Reset

Serial Ports

COM1/COM2 are connectors located at the IO Backpanel. See the table on the right for pin definitions.

Serial Port Pin Definitions (COM1/COM2)			
Pin #	Definition	Pin #	Definition
1	CD	6	DSR
2	RD	7	RTS
3	TD	8	CTS
4	DTR	9	RI
5	Ground	10	NC



A. PWR Supply Fail Detect

B. COM1

C. COM2

Wake-On-Ring

The Wake-On-Ring header is designated JWOR. This function allows your computer to "wake up" when an incoming call is received by the modem while in suspend state. See the table on the right for pin definitions. You must have a Wake-On-Ring card and cable to use this feature.

Wake-On-Ring Pin Definitions (JWOR)

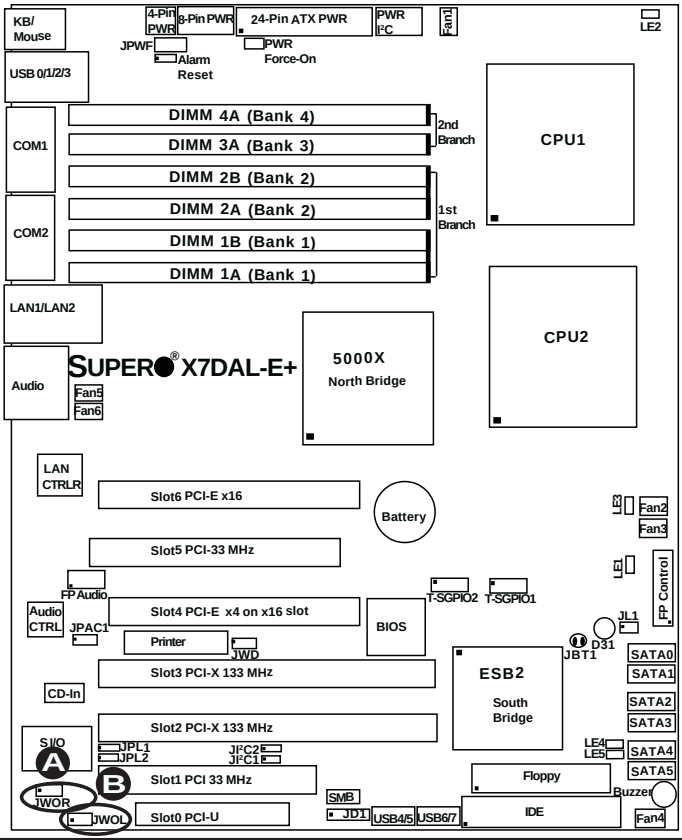
Pin#	Definition
1	Ground
2	Wake-up

Wake-On-LAN

The Wake-On-LAN header is located at JWOL on the motherboard. See the table on the right for pin definitions. (You must have a LAN card with a Wake-On-LAN connector and cable to use this feature.)

Wake-On-LAN Pin Definitions (JWOL)

Pin#	Definition
1	+5V Standby
2	Ground
3	Wake-up



A. WOR

B. WOL

GLAN 1/2 (Giga-bit Ethernet Ports)

Two G-bit Ethernet ports are located at JLAN1 on the I/O backplane. This port accepts RJ45 type cables.

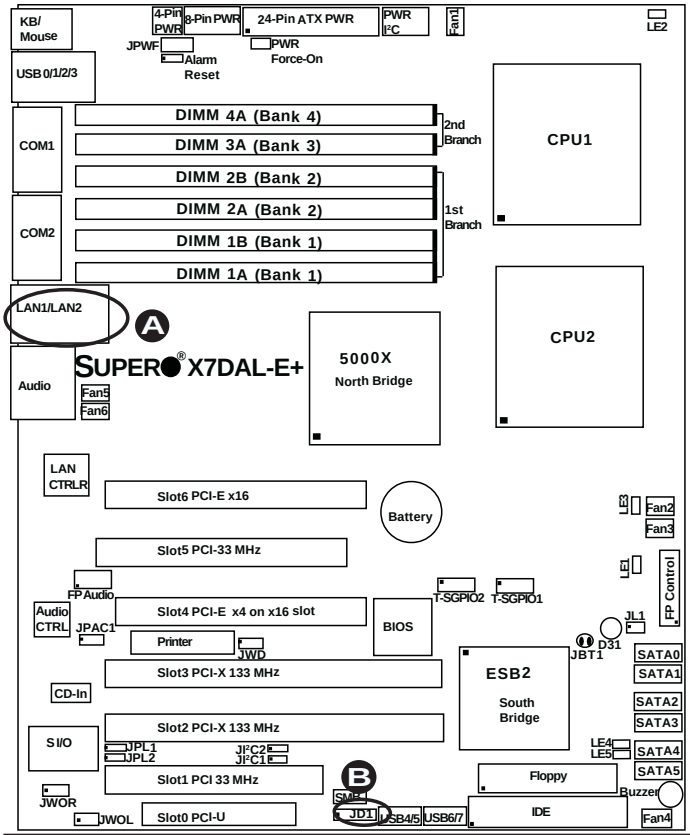
GLAN1

GLAN2

Power LED/Speaker

On the JD1 header, pins 1-3 are used for a power LED and pins 4-7 are for the speaker. See the table on the right for speaker pin definitions. To use an external speaker, connect a cable to pins 4-7 of this header. To use the onboard speaker, close pins 6-7 with a jumper.

Speaker Connector Pin Definitions	
Pin Setting	Definition
Pins 6-7	Internal Speaker
Pins 4-7	External Speaker



A. GLAN1/2

B. PWR LED/Speaker

Alarm Reset

If three power supplies are installed and Alarm Reset (JP5) is enabled, the system will notify you when any of the three power modules fails. Connect JP5 to a micro-switch to turn off the alarm that is activated when a power module fails. See the table on the right for pin definitions.

Alarm Reset Pin Definitions

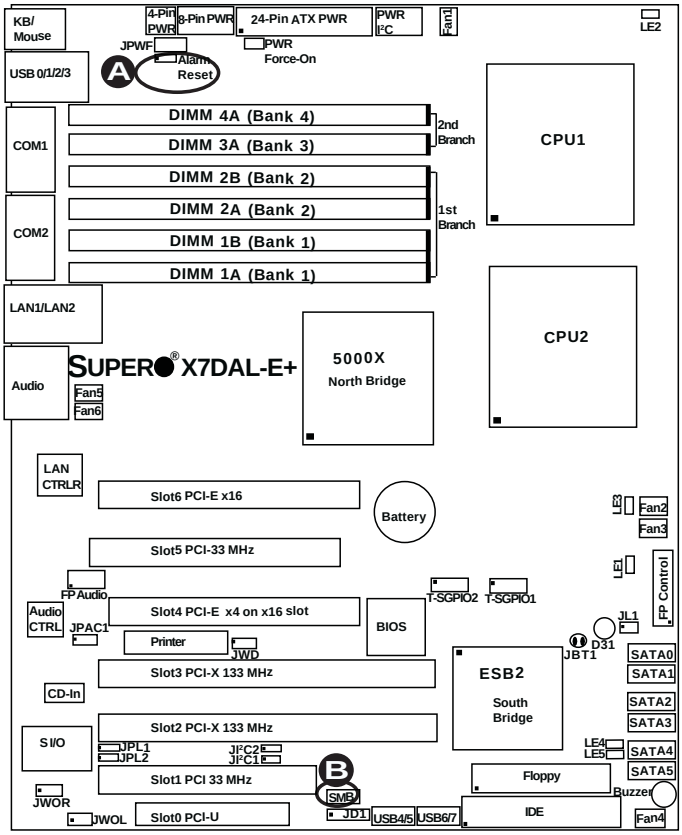
Pin Setting	Definition
Pin 1	Ground
Pin 2	+5V

SMB

A System Management Bus header is located at J18. Connect the appropriate cable here to use SMB on your system.

SMB Header Pin Definitions

Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection



A. Alarm Reset

B. SMB

Power SMB (I²C) Connector

Power SMB (I²C) Connector (JPI²C) monitors the status of the power supply, fan and system temperature. See the table on the right for pin definitions.

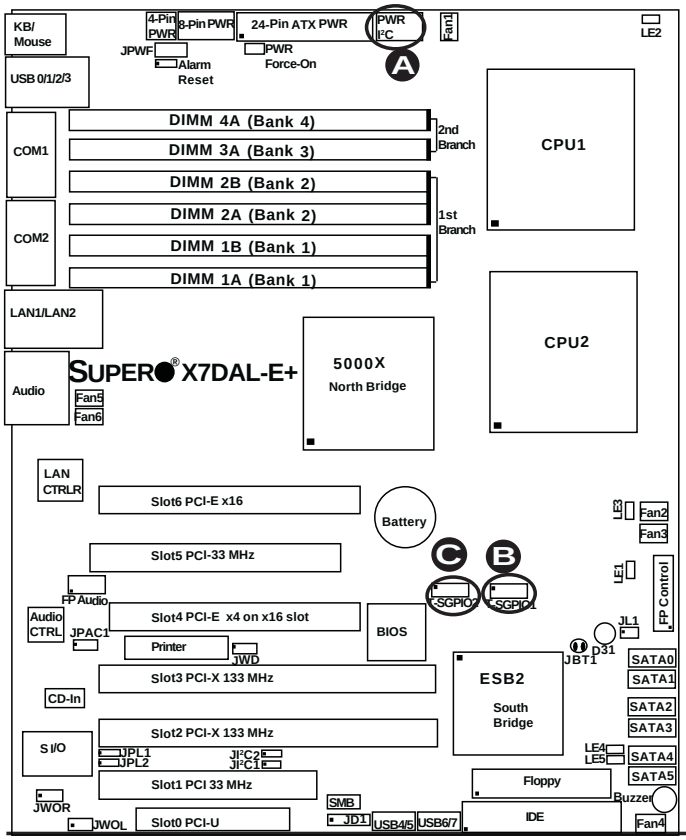
PWR SMB Pin Definitions	
Pin#	Definition
1	Clock
2	Data
3	PWR Fail
4	Ground
5	+3.3V

T-SGPIO Headers

Two T-SGPIO (Serial General Purpose Input/Output) headers are located at the motherboard. These headers are used for SATA monitoring on the backplane. See the table on the right for pin definitions. Refer to the board layout below for the locations of the headers.

SGPIO Pin Definitions			
Pin#	Definition	Pin	Definition
1	*NC	2	*NC
3	Ground	4	Data
5	Load	6	Ground
7	*NC	8	*NC

***Note:** NC= No Connections

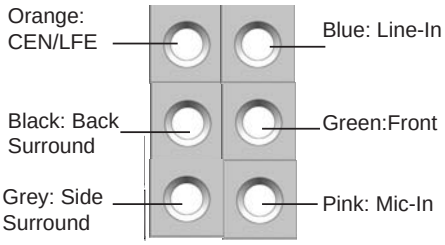


A. PWR SMB

B. T-SGPIO1

C. T-SGPIO2

High Definition Audio (HDA)



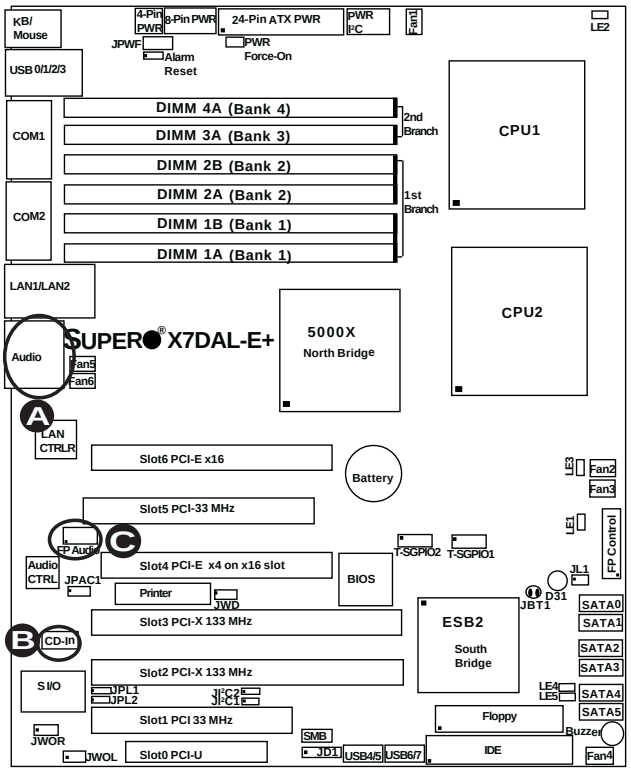
The X7DAL-E+ features a 7.1+2 Channel High Definition Audio (HDA) (J2) codec that provides 10DAC channels, simultaneously supporting 7.1 sound playback with 2 channels of independent stereo sound output with multiple streaming through the front panel stereo out to the front L&R, rear L&R, center and subwoofer speakers. Use the advanced software included in the CD-ROM that came with your motherboard to enable this function. Sound is then output through the Line In, Line Out and MIC jacks (see the graphics at right). Enable JPAC to use this feature.

CD Header/Front Panel Accessible Audio Header

A 4-pin CD header (CD2) and a Front Panel Accessible Audio header (J14) are located on the motherboard. These headers allow you to use the onboard sound for audio CD playback. Connect an audio cable from your CD drive to the header that fits your cable's connector. Only one CD header can be used at a time. See the tables at right for pin definitions.

CD2 Pin Definition

Pin#	Definition
1	Left
2	Ground
3	Ground
4	Right

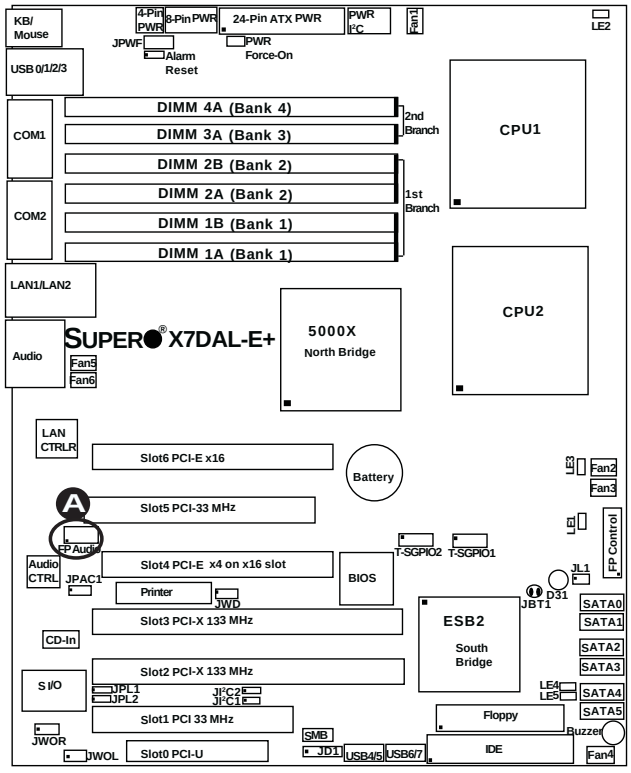


A. Line-In/Line-Out/Mi-crophone
B. CD-In
C. FP Audio

Front Panel Audio Control

When front panel headphones are plugged in, the back panel audio output is disabled. This is done through the FP Audio header (J14). If the front panel interface card is not connected to the front panel audio header, jumpers should be installed on the pin pairs: 5-6 and 9-10 of the header (J14). If these jumpers are not installed, the back panel line-out connector will be disabled, and Pin 1 of the microphone input will be left floating, which can lead to excessive microphone noise and cross talk from the back panel. See the table below for pin definitions.

High Definition Front Panel Audio	
Pins#	**Signal**
1	MIC_L
2	AUD_GND
3	MIC_R
4	FP_Audio-Detect
5	Line_2_R
6	Ground
7	FP_Jack-Detect
8	Key
9	Line_2_L
10	Ground

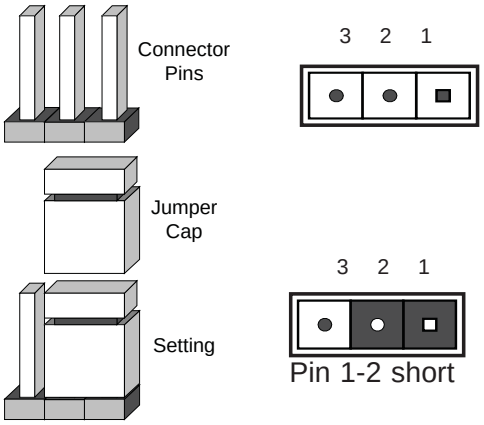


A. FP Audio

2-6 Jumper Settings

Explanation of Jumpers

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the motherboard layout pages for jumper locations.

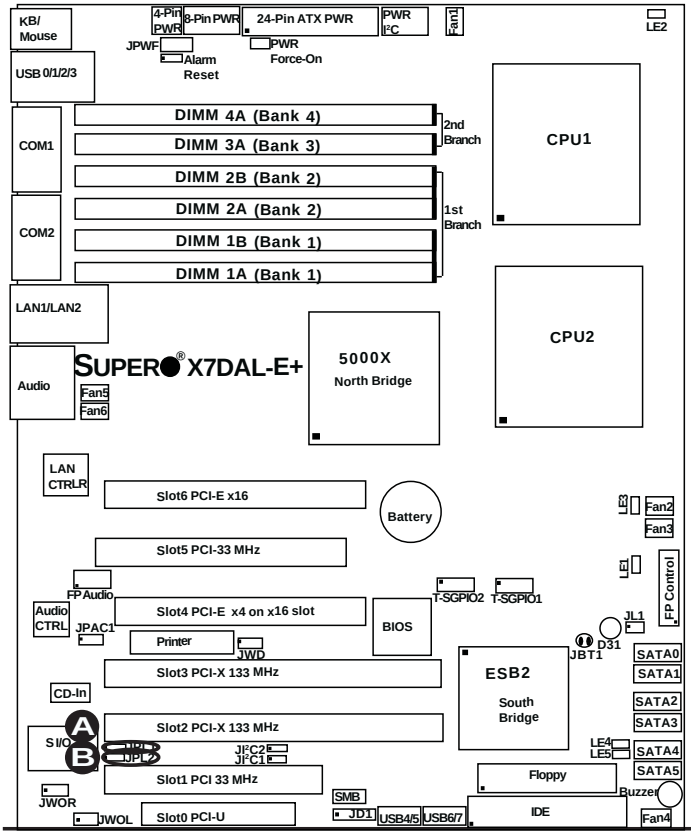


Note: On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

GLAN Enable/Disable

JPL1/JPL2 enable or disable the GLAN Port1/GLAN Port2 on the motherboard. See the table on the right for jumper settings. The default setting is enabled.

GLAN Enable Jumper settings	
Pin#	Definition
1-2	Enabled (default)
2-3	Disabled



A. GLAN Port1 Enable

B. GLAN Port2 Enable

CMOS Clear

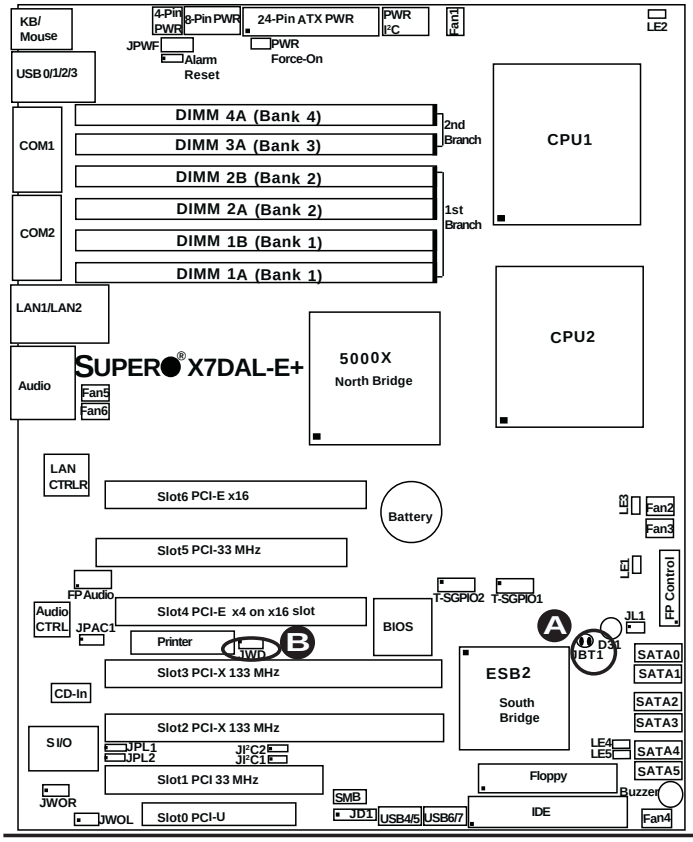
JBT1 is used to clear CMOS. Instead of pins, this "jumper" consists of contact pads to prevent the accidental clearing of CMOS. To clear CMOS, use a metal object such as a small screwdriver to touch both pads at the same time to short the connection. Always remove the AC power cord from the system before clearing CMOS.

Note: For an ATX power supply, you must completely shut down the system, remove the AC power cord and then short JBT1 to clear CMOS.

Watch Dog Enable/Disable

Watch Dog (JWD) is a system monitor that can reboot the system when a software application hangs. Close Pins 1-2 to reset the system if an application hangs. Close Pins 2-3 to generate a non-maskable interrupt signal for the application that hangs. See the table on the right for jumper settings. Watch Dog must also be enabled in the BIOS.

Watch Dog Jumper Settings (JWD)	
Jumper Setting	Definition
Pins 1-2	Reset (*default)
Pins 2-3	NMI
Open	Disabled



A. Clear CMOS

B. Watch Dog Enable

Audio Enable/Disable

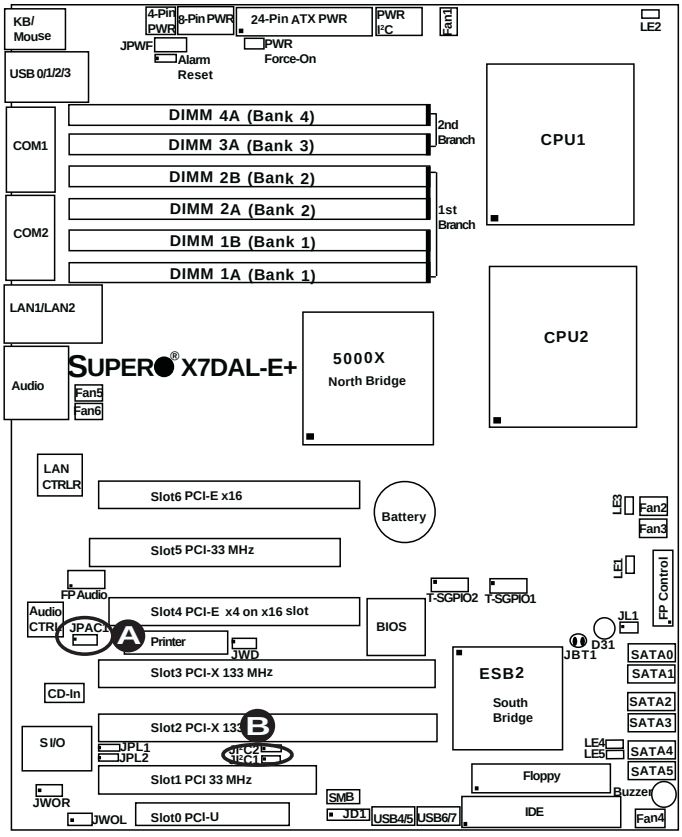
JPAC1 enables or disables the Audio Controller on the motherboard. See the table on the right for jumper settings. The default setting is enabled.

Audio Enable Jumper Settings	
Pin#	Definition
1-2	Enabled (*default)
2-3	Disabled

I²C Bus to PCI Slots

Jumpers JI²C1/JI²C2 allow you to connect the System Management Bus (I²C) to PCI slots. The default setting is Open to disable the connection. See the table on the right for jumper settings.

I²C to PCI-Slots Jumper Settings	
Jumper Setting	Definition
Closed	Enabled
Open	Disabled (*Default)



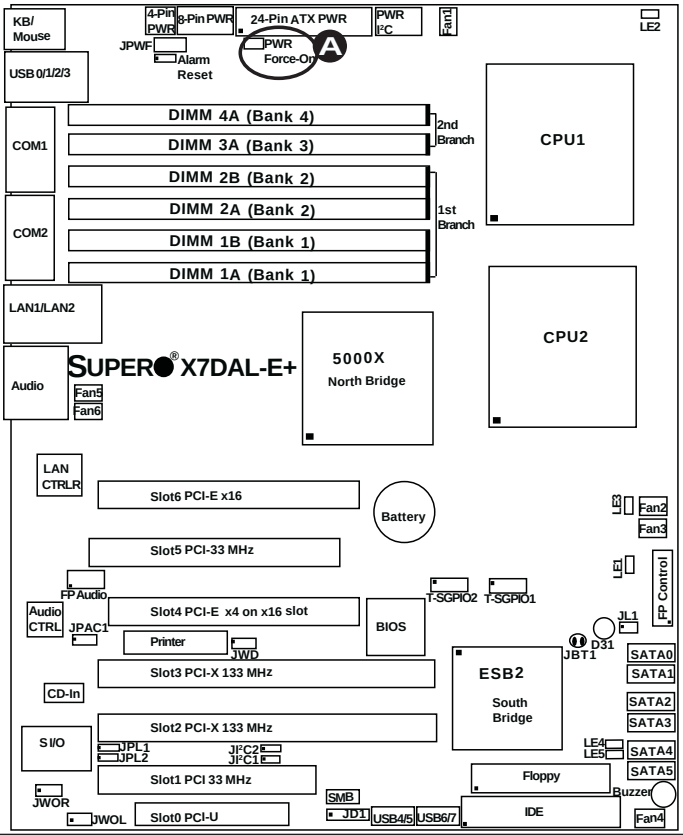
A. Audio Enabled

B. I²C Bus to PCI slots

Power Force On Enable/Disable

Jumper JPF allows you to enable the function of Power Force-On. If enabled, the power will always stay on automatically. If this function is disabled (the normal setting), the user needs to press the power button to power on the system.

Power Force On Enable/Disable Jumper Settings (JPF)	
Jumper Setting	Definition
Open	Normal (*default)
Closed	Force On

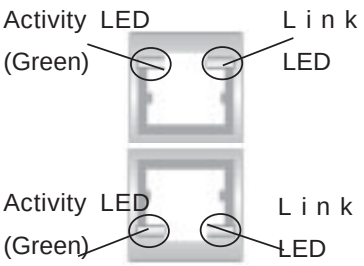


A. PWR Force-On

2-7 Onboard Indicators

GLAN LEDs

There are two GLAN ports on the motherboard. Each Gigabit Ethernet LAN port has two LEDs. The Green LED indicates activity. The other LED may be green, amber or off to indicate the speed of the connection. See the tables at right for more information.



(Rear View: When viewing from the back of the system)

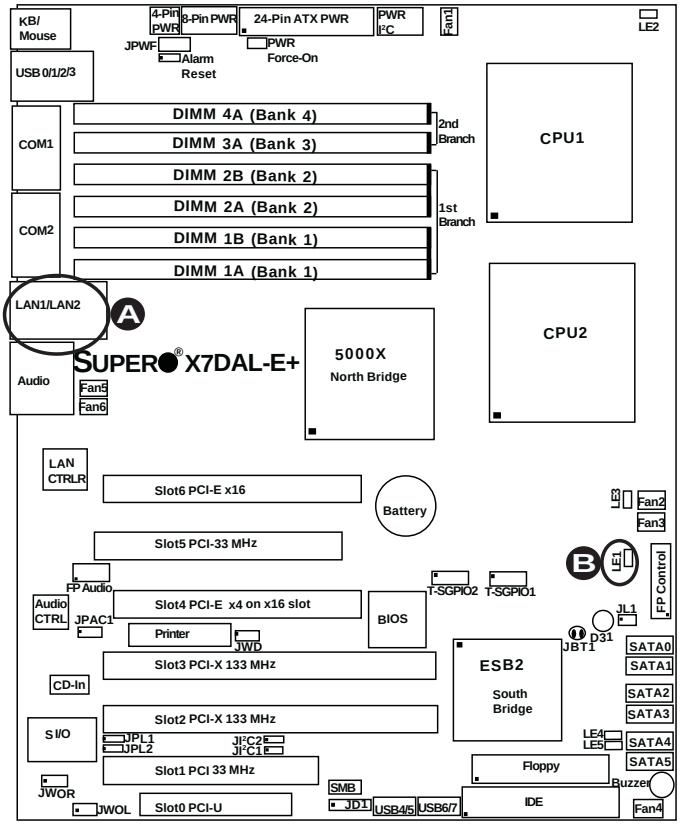
GLAN Activity Indicator		
Color	Status	Definition
Green	Flashing	Active

GLAN Link Indicator	
LED Color	Definition
Off	No Connection or 10 Mbps
Green	100 Mbps
Amber	1 Gbps

Onboard Power LED (LE1)

There is an Onboard Power LED located on the motherboard. When this LED is lit, the system is on. See the table on the right for more details.

Onboard PWR LED Indicator (LE1) LED Settings	
LED Color	Definition
Off	System Off (*PWR cable not connected)
Green	System On
Green: Flashing Quickly	ACPI S1 State
Green: Flashing Slowly	ACPI S3 (STR) State



A. GLAN LEDs

B. Onboard PWR LED

CPU VRM Overheat LED Indicators (LE2/LE3)

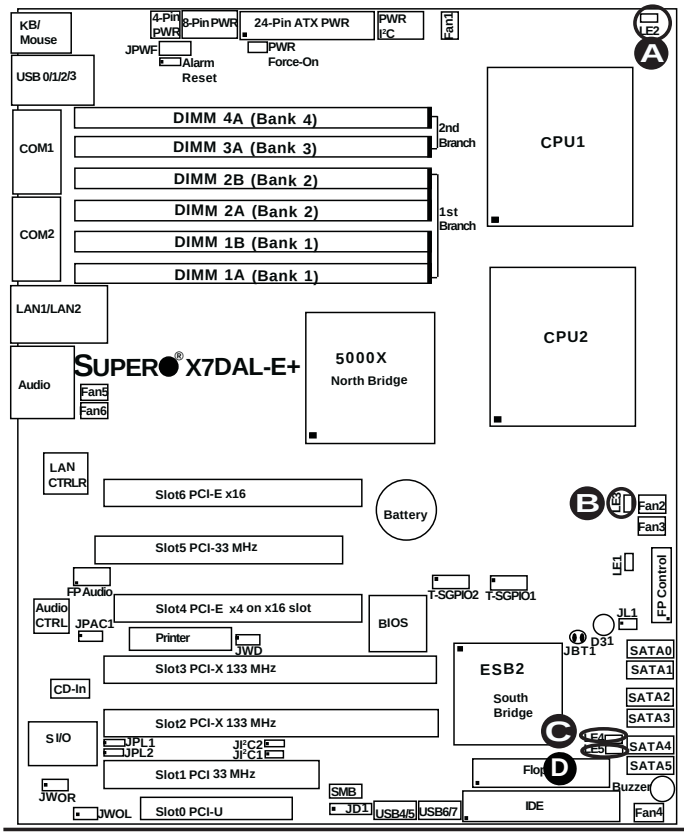
There are two CPU VRM Overheat LEDs (LE2, LE3) on the motherboard. LE2 is for CPU1VRM, and LE3 is for CPU2 VRM. When the temperature of a CPU VRM is normal, the CPU VRM Overheat LED is off. When the CPU VRM is over 90^{0}C, the CPU VRM Overheat LED will turn to yellow and the CPU will slow down to prevent CPU VRM overheat. See the layout below for the LED location.

CPU VRM Overheat LEDs (LE2, LE3) LED Settings	
LED Color	Definition
Off	CPU VRM Temperature: Normal
Yellow	CPU VRM over 90^{0}C, CPU slows down

POST Code LED Indicators (LE4/ LE5)

There are two POST Code LED Indicators (LE4, LE5) located on the motherboard. These two LEDs indicate POST (Power On Self Test) Code Messages via different sets of green and yellow light combinations. Refer to the table on the right for POST Code Messages. See the layout below for the LED location.

POST Code LED Indicators		
LE4 Green	LE5 Yellow	POST Code Message
Off	On	Memory Initialization @ POST 28h
On	Off	System Shadowing @ POST 38h
On	On	CPU Initialization @ POST 0Ah
Off	Off	POST Initialization: OK



A. LE2: CPU1VRM

B. LE3: CPU2VRM

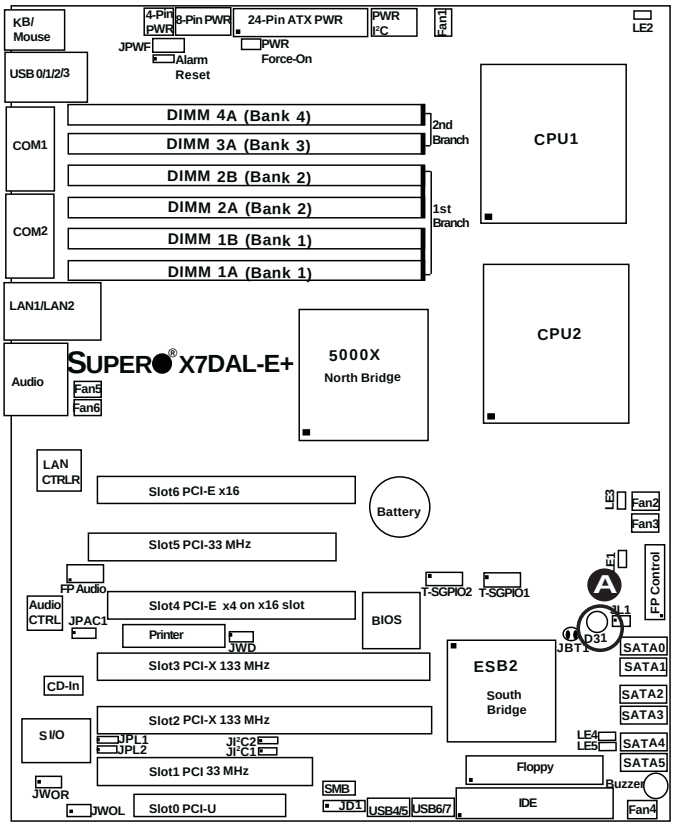
C. LE4: POST Code LED

D. LE5: POST Code LED

Status LED (D31)

A Status LED Indicator is located at D31 on the motherboard. This LED displays different colors to show the status of the system. When this amber LED is on, the power cable is still connected. Be sure to unplug the power cable before installing or removing any components from the motherboard. Refer to the table on the right for system status. See the layout below for the LED location.

Status LED Indicator LED Settings	
LED Color	Definition
Green	Power On, system: normal
Red	PWR on, PWR problem(s) occur(s) or JPW3 not properly installed
Amber	System off with PWR cable connected



A. D31: System Status LED

2-8 Parallel, Floppy Drive, PCI-U Universal and Hard Disk Drive Connections

Note the following when connecting the floppy and hard disk drive cables:

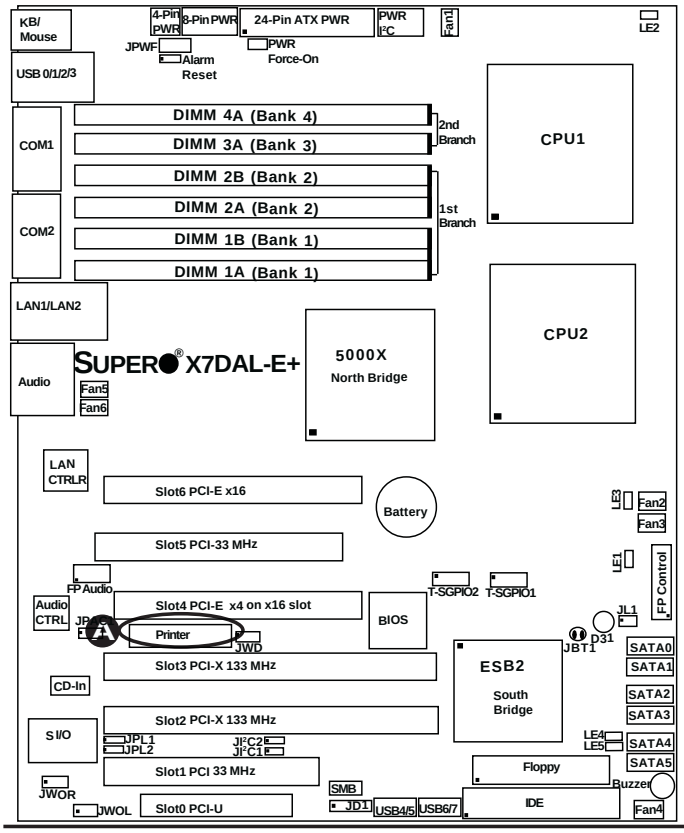
- The floppy disk drive cable has 34 twisted wires.
- A red mark on a wire typically designates the location of pin 1.

Parallel (Printer) Header

The parallel (printer) header is located at J21. See the table on the right for pin definitions. This connector requires CBL-0081 to work properly. (**Note**: CBL-0081 is not included.)

Parallel (Printer) Port Connector Pin Definitions

Pin#	Definition	Pin #	Definition
1	Strobe-	2	Auto Feed-
3	Data Bit 0	4	Error-
5	Data Bit 1	6	Init-
7	Data Bit 2	8	SLCT IN-
9	Data Bit 3	10	GND
11	Data Bit 4	12	GND
13	Data Bit 5	14	GND
15	Data Bit 6	16	GND
17	Data Bit 7	18	GND
19	ACK	20	GND
21	BUSY	22	Write Data
23	PE	24	Write Gate
25	SLCT	26	NC



A. Parallel Port

Floppy Connector

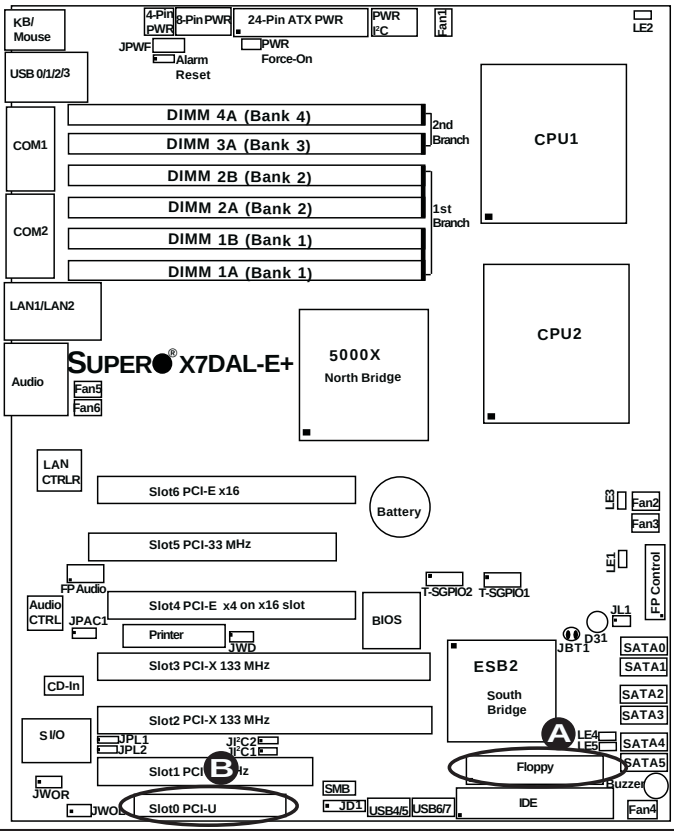
The floppy connector is located at J22. See the table below for pin definitions.

Floppy Drive Connector Pin Definitions (Floppy)

Pin#	Definition	Pin #	Definition
1	Ground	2	FDHDIN
3	Ground	4	Reserved
5	Key	6	FDEDIN
7	Ground	8	Index
9	Ground	10	Motor Enable
11	Ground	12	Drive Select B
13	Ground	14	Drive Select B
15	Ground	16	Motor Enable
17	Ground	18	DIR
19	Ground	20	STEP
21	Ground	22	Write Data
23	Ground	24	Write Gate
25	Ground	26	Track 00
27	Ground	28	Write Protect
29	Ground	30	Read Data
31	Ground	32	Side 1 Select
33	Ground	34	Diskette

PCI-U Universal Slot

PCI-U Slot, a PCI-E x8 connector, is specially designed for Supermicro's storage devices to add SAS and LAN connections to the motherboard. This slot can also support other PCI-E controllers. Refer to the layout below for the location.



A. Floppy

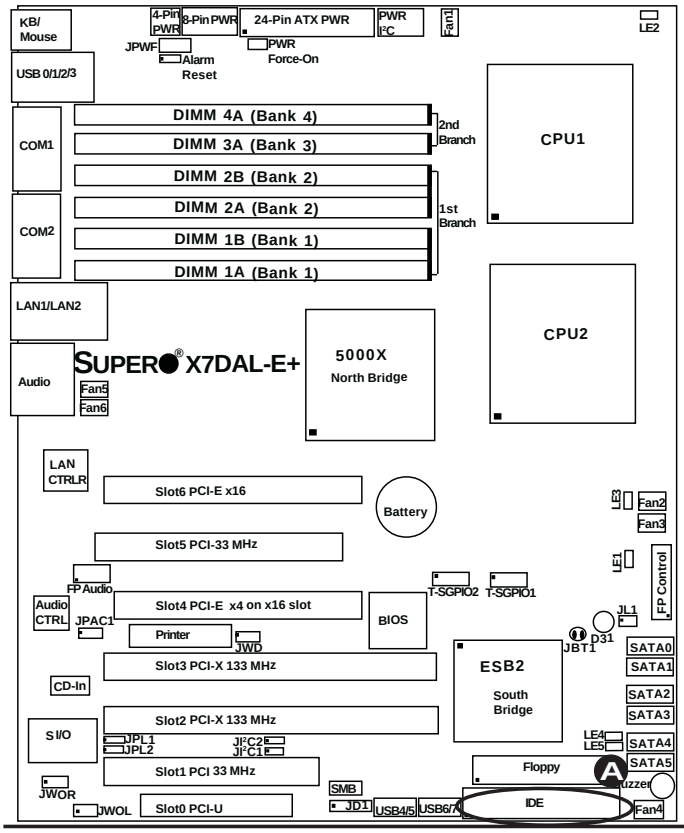
B. PCI-U Slot

IDE Connector

There is one IDE Connector on the motherboard. The IDE Connector is located at JIDE1. See the table on the right for pin definitions.

IDE Drive Connectors Pin Definitions

Pin#	Definition	Pin #	Definition
1	Reset IDE	2	Ground
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	18	Host Data 15
19	Ground	20	Key
21	DRQ3	22	Ground
23	I/O Write	24	Ground
25	I/O Read	26	Ground
27	IOCHRDY	28	BALE
29	DACK3	30	Ground
31	IRQ14	32	IOCS16
33	Addr1	34	Ground
35	Addr0	36	Addr2
37	Chip Select 0	38	Chip Select 1
39	Activity	40	Ground



A. IDE

Notes

Chapter 3
Troubleshooting

3-1 Troubleshooting Procedures

Use the following procedures to troubleshoot your system. If you have followed all of the procedures below and still need assistance, refer to the 'Technical Support Procedures' and/or 'Returning Merchandise for Service' section(s) in this chapter. **Note: Always disconnect the power cord before adding, changing or installing any hardware components.**

Before Power On

1. Make sure that there is no short circuit between the motherboard and the chassis.
2. Disconnect all ribbon/wire cables from the motherboard, including those for the keyboard and mouse.
3. Remove all add-on cards.
4. Install a CPU in the CPU Socket and connect the chassis speaker and the power LED to the motherboard. (Make sure that the CPUs are properly seated and all jumper settings are properly configured as well.)
5. Use only the correct type of CMOS onboard battery as recommended by the Manufacturer. Do not install the onboard battery upside down to avoid possible explosion.

No Power

1. Make sure that there is no short circuit between the motherboard and the chassis.
2. Verify that all jumpers are set to their default positions.
3. Check that the 115V/230V switch on the power supply is properly set.
4. Turn the power switch on and off to test the system.
5. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.

No Video

1. If the power is on but you have no video, remove all the add-on cards and cables.
2. Use the speaker to determine if any beep codes exist. Refer to the Appendix for details on beep codes.

Losing the System's Setup Configuration

1. Make sure that you are using a high quality power supply. A poor quality power supply may cause the system to lose the CMOS setup information. Refer to

Section 1-6 for details on recommended power supplies.

2. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.

3. If the above steps do not fix the Setup Configuration problem, contact your vendor for repairs.

NOTE

If you are a system integrator, VAR or OEM, a POST diagnostics card is recommended. For I/O port 80h codes, refer to App. B.

Memory Errors

1. Make sure that the DIMM modules are properly and fully installed.
2. Make sure that DIMMs of different speeds or types are not installed and verify that the BIOS setup is configured for the fastest speed of RAM used. It is recommended that you use the same speed of RAM for all DIMMs in the system.
3. Make sure you are using the correct type of DDR2 Fully Buffered (FBD) ECC 667/533 SDRAM (*recommended by the manufacturer.)
4. Check for bad DIMM modules or slots by swapping a single module between four slots and noting the results.
5. Make sure all memory modules are fully seated in their slots. As an interleaved memory scheme is used, you must install pairs of memory modules of the same type and the same speed at a time, beginning with Bank 1, then Bank 2, and so on (see Section 2-3).
6. Check the position of the 115V/230V switch on the power supply.

3-2 Technical Support Procedures

Before contacting Technical Support, please take the following steps. Also, note that as a motherboard manufacturer, Super Micro does not sell directly to end-users, so it is best to first check with your distributor or reseller for troubleshooting services. They should know of any possible problem(s) with the specific system configuration that was sold to you.

1. Please go through the 'Troubleshooting Procedures' and 'Frequently Asked Question' (FAQ) sections in this chapter or see the FAQs on our web site (http://www.supermicro.com/support/faqs/) before contacting Technical Support.
2. BIOS upgrades can be downloaded from our web site at (http://www.supermicro.com/support/bios/)
3. If you still cannot resolve the problem, include the following information when contacting Super Micro for technical support:
   - Motherboard model and PCB revision number

•BIOS release date/version (this can be seen on the initial display when your system first boots up)

•System configuration

An example of a Technical Support form is on our web site at (http://www.supermicro.com/support/contact.cfm).

4. Distributors: For immediate assistance, please have your account number ready when placing a call to our technical support department. We can be reached by e-mail at support@supermicro.com or by fax at: (408) 503-8000, option 2.

3-3 Frequently Asked Questions

Question: What are the various types of memory that my motherboard can support?

Answer: The X7DAL-E+ has six 240-pin DIMM slots that support DDR2 FBD ECC 667/533 SDRAM modules. It is strongly recommended that you do not mix memory modules of different speeds and sizes. (See Chapter 2 for detailed Information.)

Question: How do I update my BIOS?

Answer: It is recommended that you do not upgrade your BIOS if you are not experiencing any problems with your system. Updated BIOS files are located on our web site at http://www.supermicro.com/support/bios/. Please check our BIOS warning message and the information on how to update your BIOS on our web site. Select your motherboard model and download the BIOS file to your computer. Also, check the current BIOS revision and make sure that it is newer than your BIOS before downloading. You can choose from the zip file and the .exe file. If you choose the zip BIOS file, please unzip the BIOS file onto a bootable device or a USB pen. Run the batch file using the format flash.bat filename.rom from your bootable device or USB pen to flash the BIOS. Then, your system will automatically reboot. If you choose the .exe file, please run the .exe file under Windows to create the BIOS flash floppy disk. Insert the floppy disk into the system you wish to flash the BIOS. Then, bootup the system to the floppy disk. The BIOS utility will automatically flash the BIOS without any prompts. Please note that this process may take a few minutes to complete. Do not be concerned if the screen is paused for a few minutes.

(**Warning**: Do not shut down or reset the system while updating the BIOS to prevent possible system boot failure!)

Question: What's on the CD that came with my motherboard?

Answer: The supplied compact disc has quite a few drivers and programs that will greatly enhance your system. We recommend that you review the CD and install the applications you need. Applications on the CD include chipset drivers, security and audio drivers.

3-4 Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. When returning to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete. For faster service, RMA authorizations may be requested online (http://www.supermicro.com/support/rma/).

This warranty only covers normal consumer use and does not cover damage incurred in shipping or from failure due to the alternation, misuse, abuse or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.

Chapter 4
BIOS

4-1 Introduction

This chapter describes the Phoenix BIOS™Setup utility for the X7DAL-E+. The Phoenix ROM BIOS is stored in a flash chip and can be easily upgraded using a floppy disk-based program.

Note: Due to periodic changes to the BIOS, some settings may have been added or deleted and might not yet be recorded in this manual. Please refer to the Manual Download area of the Supermicro web site <http://www.supermicro.com> for any changes to the BIOS that may not be reflected in this manual.

System BIOS

BIOS is the Basic Input Output System used in all IBM® PC, XT™, AT®, and PS/2® compatible computers. Phoenix BIOS stores the system parameters, types of disk drives, video displays, etc. in the CMOS. CMOS memory requires very little electrical power. When the computer is turned off, a backup battery provides power to the CMOS Logic, enabling it to retain system parameters. Each time the computer is powered on, the computer is configured with the values stored in the CMOS Logic by the system BIOS, which gains control at boot up.

How To Change the Configuration Data

CMOS information that determines the system parameters may be changed by entering the BIOS Setup utility. This Setup utility can be accessed by pressing the <Delete> key at the appropriate time during system boot. (See below.)

Starting the Setup Utility

Normally, the only visible POST (Power On Self Test) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the BIOS Setup utility. From the main menu, you can access the other setup screens, such as the Security and Power menus. Beginning with Section 4-3, detailed descriptions are given for each parameter setting in the Setup utility.

Warning: Do not shut down or reset the system while updating BIOS to prevent possible boot failure.

4-2 Running Setup

**Default settings are in bold text unless otherwise noted.*

The BIOS setup options described in this section are selected by choosing the appropriate text from the main BIOS Setup screen. All displayed text is described in this section although the screen display is often all you need to understand how to set the options (see the next page).

When you first power on the computer, Phoenix BIO is immediately activated.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1. Press <Delete> immediately after turning the system on, or

2. When the message shown below appears briefly at the bottom of the screen during the POST (Power On Self-Test), press the <Delete> key to activate the main Setup menu:

Press the <Delete> key to enter Setup

4-3 Main BIOS Setup

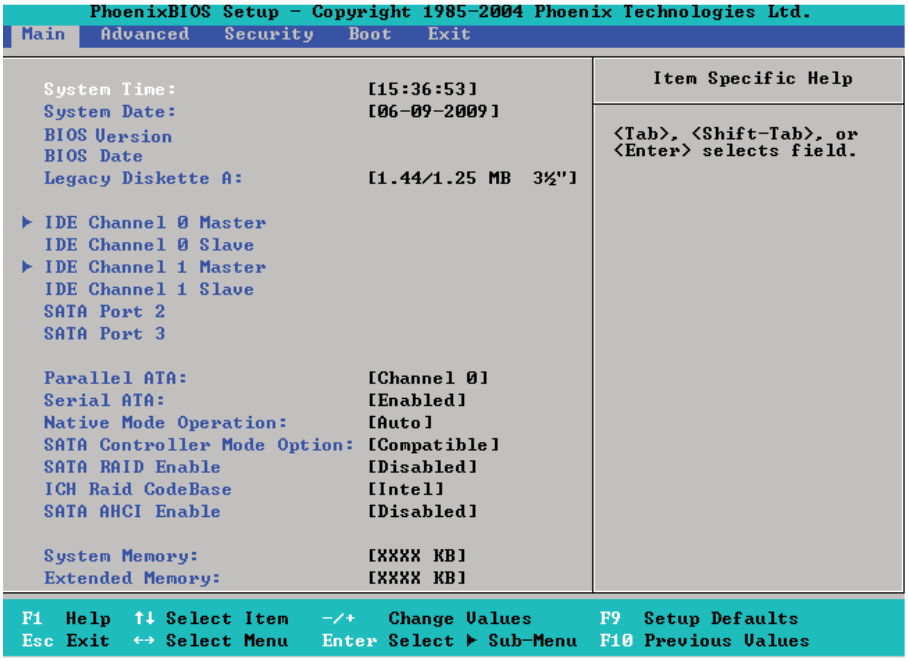
All main Setup options are described in this section. The main BIOS Setup screen is displayed below.

Use the Up/Down arrow keys to move among the different settings in each menu. Use the Left/Right arrow keys to change the options for each setting.

Press the <Esc> key to exit the CMOS Setup Menu. The next section describes in detail how to navigate through the menus.

Items that use submenus are indicated with the ▶icon. With the item highlighted, press the <Enter> key to access the submenu.

Main BIOS Setup Menu


PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Main Advanced Security Boot Exit
System Time: [15:36:53]
System Date: [06-09-2009]
BIOS Version
BIOS Date
Legacy Diskette A: [1.44/1.25 MB 3½"]
IDE Channel 0 Master
IDE Channel 0 Slave
IDE Channel 1 Master
IDE Channel 1 Slave
SATA Port 2
SATA Port 3
Parallel ATA: [Channel 0]
Serial ATA: [Enabled]
Native Mode Operation: [Auto]
SATA Controller Mode Option: [Compatible]
SATA RAID Enable [Disabled]
ICH Raid CodeBase [Intel]
SATA AHCI Enable [Disabled]
System Memory: [XXXX KB]
Extended Memory: [XXXX KB]
Item Specific Help
<Tab>, <Shift-Tab>, or <Enter> selects field.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Main Setup Features

System Time

To set the system date and time, key in the correct information in the appropriate fields. Then press the <Enter> key to save the data.

System Date

Using the arrow keys, highlight the month, day and year fields, and enter the correct data. Press the <Enter> key to save the data.

BIOS Version

This item displays the current version of the BIOS used in the system.

BIOS Date

This field displays the date when this version of BIOS was built.

Legacy Diskette A

This setting allows the user to set the type of floppy disk drive installed as diskette A. The options are Disabled, 360Kb 5.25 in, 1.2MB 5.25 in, 720Kb 3.5 in, **1.44/1.25MB**, 3.5 in and 2.88MB 3.5 in.

▶IDE Channel 0 Master/Slave, IDE Secondary Master/Slave, SATA Port0, SATA Port1, and SATA Port2

These settings allow the user to set the parameters of the slots indicated above. Press <Enter> to activate the following submenu screen for detailed options of these items. Set the correct configurations accordingly. The items included in the submenu are:

Type

This option allows the user to select the type of IDE hard drive. The option **Auto** will allow the BIOS to automatically configure the parameters of the HDD installed at the connection. Select User to allow the user to enter the parameters of the HDD installed. Select CDROM if a CDROM drive is installed. Select Removable ATAPI if other type of ATAPI device is installed. Select None if there is no IDE device installed.

LBA Format

The following items will be displayed by the BIOS:

Total Sectors: This item displays the number of total sectors available in the LBA Format.

Maximum Capacity: This item displays the maximum capacity in the LBA Format.

Multi-Sector Transfers

This item allows the user to specify the number of sectors per block to be used in multi-sector transfer. The options are Disabled, 4 Sectors, 8 Sectors, and **16 Sectors**.

LBA Mode Control

This item determines if Phoenix BIOS will access the IDE Channel 0 Master Device via the LBA mode. The options are **Enabled** and Disabled.

32 Bit I/O

This option allows the user to enable or disable the function of 32-bit data transfer. The options are Enabled and **Disabled**.

Transfer Mode

This option allows the user to set the transfer mode. The options are Standard, Fast PIO1, Fast PIO2, Fast PIO3, Fast PIO4, FPIO3/DMA1 and **FPIO4/DMA2**.

Ultra DMA Mode

This option allows the user to configure the Ultra DMA Mode settings. The options are Disabled, Mode 0, Mode 1, **Mode 2**, Mode 3, Mode 4, and Mode 5.

Parallel ATA

This setting allows the user to enable Parallel ATA. The options are Disabled and **Enabled**.

Serial ATA

Select Enabled to enable Serial ATA. The options are Disabled and **Enabled.**

Native Mode Operation (Available when SATA Controller Mode Operation is set to Enhanced)

Use this feature to select native mode settings for ATA. The options are: Serial ATA and **Auto**.

SATA Controller Mode Operation

Select **Compatible** to allow the SATA and PATA drives to be automatically-detected and be placed in the Legacy Mode by the BIOS. Select Enhanced to allow the SATA and PATA drives to be to be automatically-detected and placed in the Native IDE Mode. (**Note: The Enhanced mode is supported by the Windows 2000 OS or a later version.)** When the SATA Controller Mode is set to Enhanced, the following items will display:

Serial ATA (SATA) RAID Enable (Available when SATA Controller Mode is set to Enhanced)

Select Enable to enable Serial ATA RAID. (For the Windows OS environment, use the RAID driver if this feature is set to Enabled. When this item is set to Enabled, the item: "ICH RAID Code Base" will be available for you to select either Intel or Adaptec Host RAID firmware. If this item is set to **Disabled**, the item-SATA AHCI Enable will be available.) The options are Enabled and **Disabled**.

ICH RAID Code Base (Available when SATA RAID is Enabled)

Select Intel to enable Intel's SATA RAID firmware. Select Adaptec to use Adaptec's HostRAID firmware. The options are **Intel** and Adaptec**.**

SATA AHCI (Available when SATA RAID is Enabled)

Select Enable to enable Serial ATA Advanced Host Interface. (Take caution when using this function. This feature is for advanced programmers only.) The options are Enabled and **Disabled**.

System Memory

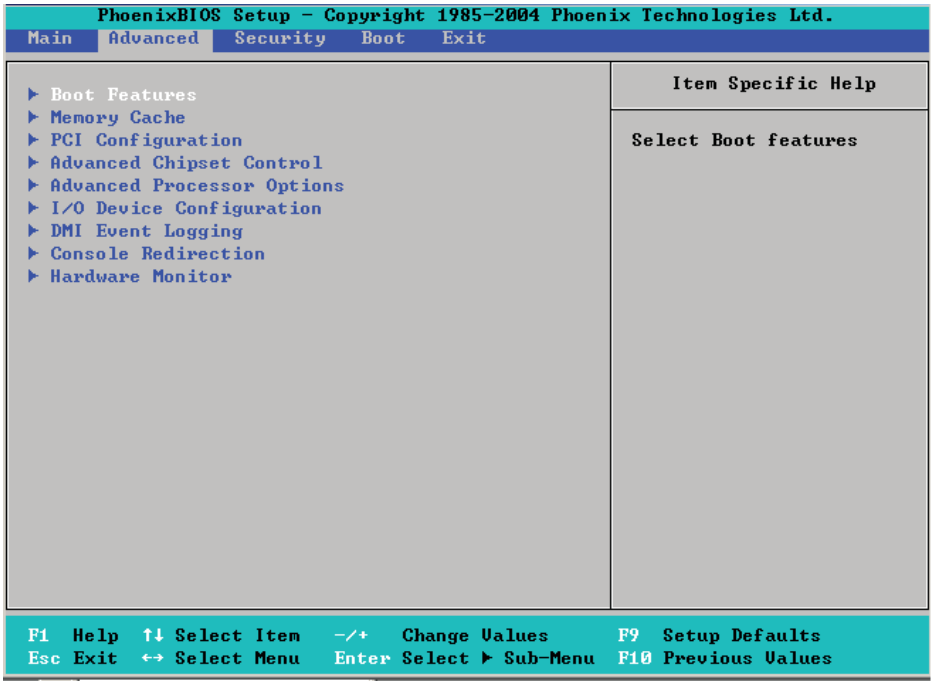
This display informs you how much system memory is detected by the BIOS.

Extended Memory

This display informs you how much extended memory is detected by the BIOS.

4-4 Advanced Setup

Choose Advanced from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. The items with a triangle beside them have sub menus that can be accessed by highlighting the item and pressing <Enter>.



▶Boot Features

Access the submenu to make changes to the following settings.

QuickBoot Mode

If enabled, this feature will speed up the POST (Power On Self Test) routine by skipping certain tests after the computer is turned on. The settings are **Enabled** and Disabled. If Disabled, the POST routine will run at normal speed.

QuietBoot Mode

This setting allows you to **Enable** or Disable the graphic logo screen during boot-up.

POST Errors

Set to **Enabled** to display POST Error Messages if an error occurs during bootup. If set to Disabled, the system will continue to boot without displaying any error message even when a boot error occurs.

ACPI Mode

Select Yes to employ ACPI (Advanced Configuration and Power Interface) power management on your system. The options are **Yes** and No.

ACPI Sleep Mode

Use the feature to configure the ACPI (Advanced Configuration and Power Interface) power management settings for your system when the system is in the sleep mode. The options are **S1,** S3 and S1 & S3.

Power Button Behavior

If set to **Instant-Off**, the system will power off immediately as soon as the user presses the power button. If set to 4-sec., the system will power off when the user presses the power button for 4 seconds or longer. The options are **instant-off** and 4-sec override.

Resume On Modem Ring

Select On to “wake up" your system up when an incoming call is received by your modem. The options are On and **Off**.

Keyboard On Now Function

This feature allows you to decide how a user can power on the system by using the keyboard when it is in S3 or S5 state. Select **Disabled** to disable this feature. Select Space to allow the user to power on the system when the user presses the <Space> bar. Select Password to allow the user to power on the system by entering a pre-defined password. (The preset password must be 5-character long.)

Power Loss Control

This setting allows you to decide how the system will react when power returns after an unexpected loss of power. The options are Stay Off, Power On, and **Last State**.

Watch Dog

When set to Enabled, this feature will automatically reset the system if the system is not active for more than 5 minutes. The options are Enabled and **Disabled**.

Summary Screen

This setting allows you to **Enable** the summary screen which displays the system configuration at bootup.

▶Memory Cache

Cache System BIOS Area

This setting allows you to designate a reserve area in the system memory to be used as a System BIOS buffer to allow the BIOS to write (cache) data into this reserved memory area. Select **Write Protect** to enable this function, and this area will be reserved for BIOS ROM access only. Select Uncached to disable this function and make this area available for other devices.

Cache Video BIOS Area

This setting allows you to designate a reserve area in the system memory to be used as a Video BIOS buffer to allow the BIOS to write (cache) data into this reserved memory area. Select **Write Protect** to enable the function and this area will be reserved for Video BIOS ROM access only. Select Uncached to disable this function and make this area available for other devices.

Cache Base 0-512K

If enabled, this feature will allow the data stored in the base memory area: block 0-512K to be cached (written) into a buffer, a storage area in Static DROM (SDROM) or to be written into L1, L2 ache inside the CPU to speed up CPU operations. Select Uncached to disable this function. Select Write Through to allow data to be cached into the buffer and written into the system memory at the same time. Select Write Protect to prevent data from being written into the base memory area of Block 0-512K. Select Write Back to allow the CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are Uncached, Write Through, Write Protect, and **Write Back**.

Cache Base 512K-640K

If enabled, this feature will allow the data stored in the memory area: 512K-640K to be cached (written) into a buffer, a storage area in the Static DROM (SDROM) or written into L1, L2, L3 cache inside the CPU to speed up CPU operations. Select Uncached to disable this function. Select Write Through to allow data to be cached into the buffer and written into the system memory at the same time. Select Write Protect to prevent data from being written into the base memory area of Block 512-640K. Select Write Back to allow the CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are Uncached, Write Through, Write Protect, and **Write Back**.

Cache Extended Memory Area

If enabled, this feature will allow the data stored in the extended memory area to be cached (written) into a buffer, a storage area in Static DROM (SDROM) or written into L1, L2, L3 cache inside the CPU to speed up CPU operations. Select Uncached to disable this function. Select Write Through to allow data to be cached into the buffer and written into the system memory at the same time. Select Write Protect to prevent data from being written into the extended memory area above 1MB. Select Write Back to allow the CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are Uncached, Write Through, Write Protect, and **Write Back.**

Discrete MTRR Allocation

If enabled, MTRRs (-Memory Type Range Registers) are configured as distinct, separate units and cannot be overlapped. If enabled, the user can achieve better graphic effects when using a Linux graphic driver that requires the write-combining configuration with 4GB or more memory. The options are Enabled and **Disabled**.

▶PCI Configuration

Access the submenu to make changes to the following settings for PCI devices.

Onboard GLAN1/Onboard GLAN2 (Gigabit- LAN) OPROM Configure

Select Enabled to boot from GLAN. The options are **Disabled** and Enabled.

Default Primary Video Adapter

This feature allows the user to specify which video adapter to be used as the default primary video adapter--the onboard video adapter or others. The options are Other and **PCI-E x16**.

Emulated IRQ Solutions

When Enabled, the Emulated IRQ Scheme will allow PCI devices to run on legacy operating systems that use the MSI mechanism to generate INTX compatible interrupts. The options are **Disabled** and Enabled.

PCI-Exp. I/O Performance

Some add-on cards perform faster with the coalesce feature, which limits the payload size to 128 Bytes; while others perform faster with a payload size of 256 Bytes which inhibits coalesce features. Please refer to your add-on card user guide for the desired setting. The options are Payload (256 Bytes) and **Coalesce (128 Bytes)**.

PCI Parity Error Forwarding

The feature allows SERR and PERR errors detected in PCI slots to be sent (forwarded) to the BIOS DMI Event Log for the user to review. The options are Enabled and **Disabled**.

ROM Scan Ordering

This feature allows the user to decide which Option ROM to be activated first. The options are **Onboard first** and Add-On first.

PCI Fast Delayed Transaction

Enable this function to improve DMA data transfer rate for a PCI 32-bit multimedia card. The options are Enable and **Disabled**.

Reset Configuration Data

If set to Yes, this setting clears the Extended System Configuration Data- (ESCD) area. The options are Yes and **No**.

Frequency for PCI-X#2-#3

This option allows the user to change the bus frequency for the devices installed in the slot indicated. The options are **Auto**, PCI 33 MHz, PCI 66 MHz, PCI-X 66 MHz, PCI-X 100 MHz, and PCI-X 133 MHz.

▶Slot0 PCI-U x8, Slot1 PCI 33MHz, Slot2 PCI-X 133MHz, Slot3 PCI-X 133MHz, Slot4 PCI-Exp x4, Slot5 PCI 33MHz, Slot6 PCI-Exp x16

Access the submenu for each of the settings above to make changes to the following:

Option ROM Scan

When enabled, this setting will initialize the device expansion ROM. The options are **Enabled** and Disabled.

Enable Master

This setting allows you to enable the selected device as the PCI bus master. The options are **Enabled** and Disabled.

Latency Timer

This setting allows you to set the clock rate for Bus Master. A high-priority, high-throughout device may benefit from a greater clock rate. The options are **Default**, 0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, and 00E0h. For Unix, Novell and other Operating Systems, please select the option: other. If a drive fails after the installation of a new software, you might want to change this setting and try again. A different OS requires a different Bus Master clock rate**.**

Large Disk Access Mode

This setting determines how large hard drives are to be accessed. The options are **DOS** or Other (for Unix, Novelle NetWare and other operating systems).

▶Advanced Chipset Control

Access the submenu to make changes to the following settings.

Warning: Take Caution when changing the Advanced settings. Incorrect values entered may cause system malfunction. Also, a very high DRAM frequency or incorrect DRAM timing may cause system instability. When this occurs, revert to the default setting.

SERR Signal Condition

This setting specifies the ECC Error conditions that an SERR# is to be asserted. The options are None, **Single Bit**, Multiple Bit, and Both.

4GB PCI Hole Granularity

This feature allows you to select the granularity of PCI hole for PCI slots. If MTRRs are not enough, this option may be used to reduce MTRR occupation. The options are: **256 MB**, 512 MB, 1GB and 2GB.

Memory Branch Mode

This option determines how the memory branch operates. System address space can either be interleaved between two channels or Sequential from one channel to another. Single Channel 0 allows a single DIMM population during system manufacturing. The options are **Interleave**, Sequential, Mirror, and Single Channel 0.

Branch 0 Rank Interleaving & Sparing

Select enable to enable the functions of Memory Interleaving and Memory Sparing for Branch 0 Rank. The options for Memory Interleaving are 1:1, 2:1 and **4:1**. The options for Sparing are Enabled and **Disabled**.

Branch 1 Rank Interleaving & Sparing

Select enable to enable the functions of Memory Interleaving and Memory Sparing for Branch 1 Rank. The options for Memory Interleaving are 1:1, 2:1 and **4:1**. The options for Sparing are Enabled and **Disabled**.

Enhanced x8 Detection

Select **Enabled** to enable Enhanced x8 DRAM UC Error Detection. The options are Disabled and **Enabled**.

High Temperature DRAM Operation

When set to Enabled, the BIOS will refer to the SPD table to set the maximum DRAM temperature. If disabled, the BIOS will set the maximum DRAM temperature based on a predefined value. The options are Enabled and **Disabled**.

AMB Thermal Sensor

Select Enabled to activate the thermal sensor embedded in the Advanced Memory Buffer on a fully buffered memory module for thermal monitoring. The options are **Disabled** and Enabled.

Thermal Throttle

Select Enabled to enable closed-loop thermal throttling on a fully buffered (FBD) memory module. In the closed-loop thermal environment, thermal throttling will be activated when the temperature of the FBD DIMM module exceeds a predefined threshold. The options are Enabled and **Disabled**.

Global Activation Throttle

Select Enabled to enable open-loop global thermal throttling on a fully buffered (FBD) memory module to make it active whenever the number of activation exceeds a predefined number. The options are Enabled and **Disabled**.

Snoop Filter

Select Enabled to eliminate snoop traffic to the graphics port to greatly improve system performance when running graphics-intensive applications. The options are **Enabled** and Disabled.

Crystal Beach Features

This feature is intended to work with the Intel I/O AT (Acceleration Technology) to accelerate the performance of TOE devices. (**Note**: A TOE device is a specialized, dedicated processor that is installed on an add-on card or a network card to handle some or all packet processing of the card. For this motherboard, the TOE device is built inside the ESB 2 South Bridge chip.) The options are **Enabled** and Disabled.

Route Port 80h Cycles to

This feature allows the user to decide which bus to send debug information to. The options are Disabled, **PCI** and LPC.

Clock Spectrum Feature

If Enabled, the BIOS will monitor the level of Electromagnetic Interference caused by the components and will attempt to decrease the interference whenever needed. The options are Enabled and **Disabled**.

High Precision Event Time

Select Yes to activate the High Precision Event Timer (HPET), which is capable of producing periodic interrupts at a much higher frequency than a Real-time Clock (RTC) can in synchronizing multimedia streams, providing smooth playback and reducing the dependency on other timestamp calculation devices, such as an x86 RDTSC Instruction embedded in a CPU. The High Precision Event Timer is used to replace the 8254 Programmable Interval Timer. The options for this feature are Yes and **No**.

USB Function

Select Enabled to use USB devices. The settings are **Enabled** and Disabled.

Legacy USB Support

This setting allows you to enable support for Legacy USB devices. The settings are **Enabled** and Disabled.

▶Advanced Processor Options

Access the submenu to make changes to the following settings.

CPU Speed

This is a display that indicates the speed of the installed processor.

Frequency Ratio (Available when supported by the CPU.)

The feature allows the user to set the internal frequency multiplier for the CPU. The options are: **Default,** x12, x13, x14, x15, x16, x17 and x18.

Hyperthreading (Available when supported by the CPU.)

Set to Enabled to use the Hyperthreading Technology, which will result in increased CPU performance. The options are Disabled and **Enabled.**

Machine Checking (Available when supported by the CPU.)

Set to Enabled to activate the function of Machine Checking and allow the CPU to detect and report hardware (machine) errors via a set of model-specific registers (MSRs). The options are Disabled and **Enabled**.

C1 Enhanced Mode (Available when supported by the CPU.)

Set to Enabled to enable Enhanced Halt State to lower CPU voltage/frequency to prevent overheat. The options are Enabled and **Disabled**. (**Note:** please refer to Intel's web site for detailed information.)

Execute Disable Bit (Available if supported by the CPU & the OS.)

Set to **Enabled** to enable Execute Disable Bit and allow the processor to classify areas in memory where an application code can execute and where it cannot, and thus preventing a worm or a virus from inserting and creating a flood of codes to overwhelm the processor or damage the system during an attack. The options are **Enabled** and Disabled. (**Note**: For more information regarding hardware/software support for this function, please refer to Intel's and Microsoft's web sites.)

Adjacent Cache Line Prefetch (Available when supported by the CPU.)

The CPU fetches the cache line for 64 bytes if this option is set to Disabled. The CPU fetches both cache lines for 128 bytes as comprised if Enabled. The options are **Disabled** and Enabled.

Hardware Prefetcher (Available when supported by the CPU.)

Set to this option to **enabled** to enable the hardware components that are used in conjunction with software programs to prefetch data in order to shorten execution cycles and maximize data processing efficiency. The options are Disabled and **Enabled**.

Direct Cache Access (Available when supported by the CPU.)

Set to Enable to route inbound network IO traffic directly into processor caches to reduce memory latency and improve network performance. The options are Disabled and **Enabled**.

Intel <R> Virtualization Technology (Available when supported by the CPU.)

Select Enabled to use the feature of Virtualization Technology to allow one platform to run multiple operating systems and applications in independent partitions, creating multiple "virtual" systems in one physical computer. The options are Enabled and **Disabled**. (**Note**: If there is any change to this setting, you will need to power off and restart the system for the change to take effect.) Please refer to Intel's web site for detailed information.

Intel EIST Support (Available when supported by the CPU.)

Select Enabled to use the Enhanced Intel SpeedStep Technology and allows the system to automatically adjust processor voltage and core frequency in an effort to reduce power consumption and heat dissipation. The options are Enabled and **Disabled**. Please refer to Intel's web site for detailed information.

▶I/O Device Configuration

Access the submenu to make changes to the following settings.

KBC Clock Input

This setting allows you to select clock frequency for the keyboard clock. The options are 6MHz, 8MHz, **12MHz,** and 16MHz.

Serial Port A

This setting allows you to decide how Serial Port A is controlled. The options are **Enabled** (user defined), Disabled, and Auto (BIOS- or OS- controlled).

Base I/O Address

This setting allows you to select the base I/O address for Serial Port A. The options are **3F8**, 2F8, 3E8, and 2E8.

Interrupt

This setting allows you to select the IRQ (interrupt request) for Serial Port A. The options are IRQ3 and **IRQ4**.

Serial Port B

This setting allows you to decide how Serial Port B is controlled. The options are **Enabled** (user defined), Disabled, Auto (BIOS controlled) and OS Controlled.

Mode

This setting allows you to select the type of device to be connected to Serial Port B. The options are **Normal** and IR (for an infrared device).

Base I/O Address

This setting allows you to select the base I/O address for Serial Port B. The options are 3F8, **2F8**, 3E8 and 2E8.

Interrupt

This setting allows you to select the IRQ (interrupt request) for Serial Port B. The options are **IRQ3** and IRQ4.

Parallel Port

This setting allows you to decide how Parallel Port is controlled. The options are **Enabled** (user defined), Disabled and Auto (BIOS-or OS- controlled).

Base I/O Address

Select the base I/O address for the parallel port. The options are **378**, 278 and 3BC.

Interrupt

This setting allows you to select the IRQ (interrupt request) for the parallel port. The options are IRQ5 and **IRQ7**.

Mode

This feature allows you to select Parallel Port mode settings. The options are Output only, Bi-Directional, EPP and **ECP**.

DMA Channel

This item allows you to select the DMA channel for the Parallel Port. The options are DMA1 and **DMA3**.

Floppy Disk Controller

This setting allows you to decide how the floppy disk drive is controlled. The options are **Enabled** (user defined), Disabled, and Auto (BIOS and OS controlled).

Base I/O Address

This setting allows you to select the base I/O address for the floppy disk drive. The options are **Primary** and Secondary.

▶DMI Event Logging

Access the submenu to make changes to the following settings.

Event Log Validity

This is a display to inform you of the event log validity. It is not a setting.

Event Log Capacity

This is a display to inform you of the event log capacity. It is not a setting.

View DMI Event Log

Highlight this item and press <Enter> to view the contents of the event log.

Event Logging

This setting allows you to **Enable** or Disable event logging.

ECC Event Logging

This setting allows you to **Enable** or Disable ECC event logging.

Mark DMI Events as Read

Highlight this item and press <Enter> to mark the DMI events as read.

Clear All DMI Event Logs

Select Yes and press <Enter> to clear all DMI event logs. The options are Yes and **No**.

▶Console Redirection

Access the submenu to make changes to the following settings.

COM Port Address

This item allows you to specify which COM port to direct the remote console to: Onboard COM A or Onboard COM B. This setting can also be **Disabled**.

BAUD Rate

This item allows you to set the BAUD rate for Console Redirection. The options are 300, 1200, 2400, 9600, **19.2K**, 38.4K, 57.6K, and 115.2K.

Console Type

This item allows you to choose the type of Console Redirection. The options are VT100, VT100,8bit, PC-ANSI, 7bit, **PC ANSI**, VT100+, and VT-UTF8.

Flow Control

This item allows you to set the flow control for Console Redirection. The options are: None, XON/XOFF, and **CTS/RTS**.

Console Connection

This item allows you to decide how Console Redirection is to be connected: either **Direct** or Via Modem.

Continue CR after POST

This item allows you to decide whether you want to continue with Console Redirection after POST routines. The options are On and **Off**.

▶Hardware Monitor

This feature allows the user to monitor system health and review the status of each item as displayed.

Overheat Alarm

This option allows the user to select the CPU Overheat Alarm setting which determines when the CPU OH alarm will be activated to provide warning of possible CPU overheat.

Warning! 1.Any temperature that exceeds the CPU threshold temperature predefined by the CPU manufacturer may result in CPU overheat or system instability. When the CPU temperature reaches this predefined threshold, the CPU and system cooling fans will run at full speed.

2. To avoid possible system overheating, please be sure to provide adequate airflow to your system.

The options are:

- Early Trigger: Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered as soon as the CPU temperature reaches the CPU overheat threshold as predefined by the CPU manufacturer.

- **Normal Trigger**: Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered when the CPU temperature reaches about 5ºC above the threshold temperature as predefined by the CPU manufacturer to give the CPU and system fans additional time needed for CPU and system cooling. In both the alarms above, please take immediate action as shown below.

CPU Temperature/System Temperature

Note: The following item display current temperature readings for the CPU and the system. These items are displayed for your reference only.

CPU1 Temperature/CPU1 Secondary Core/CPU2 Temperature/ CPU2 Secondary Core

The CPU Temperature feature will display the CPU temperature status as detected by the BIOS:

Low – This level is considered as the 'normal' operating state. The CPU temperature is well below the CPU 'Temperature Tolerance'. The motherboard fans and CPU will run normally as configured in the BIOS (Fan Speed Control).

Medium – The processor is running warmer. This is a 'precautionary' level and generally means that there may be factors contributing to this condition, but

the CPU is still within its normal operating state and below the CPU 'Temperature Tolerance'. The motherboard fans and CPU will run normally as configured in the BIOS. The fans may adjust to a faster speed depending on the Fan Speed Control settings.

High – The processor is running hot. This is a 'caution' level since the CPU's 'Temperature Tolerance' has been reached (or has been exceeded) and may activate an overheat alarm. The system may shut down if it continues for a long period to prevent damage to the CPU.

User intervention: If the system buzzer and Overheat LED has activated, take action immediately by checking the system fans, chassis ventilation and room temperature to correct any problems.

System Temperature

Fan1-Fan6 Speeds: If the feature of Auto Fan Control is enabled, the BIOS will automatically display the status of the fans indicated in this item.

Fan Speed Control Modes

This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. When the CPU on-die temperature increases, the fan speed will also increase, and vice versa. If the option is set to 3-pin fan, the fan speed is controlled by voltage. If the option is set to 4-pin, the fan speed will be controlled by Pulse Width Modulation (PWM). Select 3-pin if your chassis came with 3-pin fan headers. Select 4-pin if your chassis came with 4-pin fan headers. Select Workstation if your system is used as a Workstation. Select Server if your system is used as a Server. Select Disable to disable the fan speed control function and allow the onboard fans to constantly run at full speed (12V). Select 4-pin Quiet (or Super Quiet) to lower the fan speed and noise. The Options are: **1. Disable (Full Speed)**, 2. 3-pin (Server), 3. 3-pin (Workstation), 4. 4-pin (Server), 5. 4-pin (Workstation), 6. 4-pin (Quiet) and 7. 4-pin (Super Quiet).

Voltage Monitoring

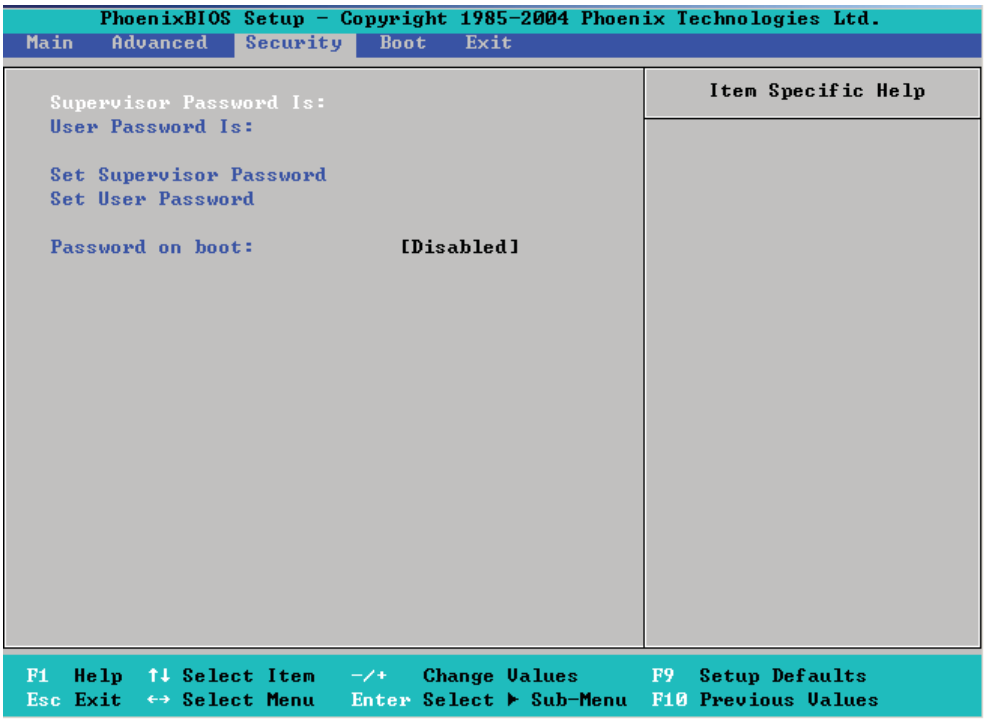
The following items will be monitored and displayed:

Vcore A, Vcore B, -12V, +12V, P1V5, +3.3V, 5Vsb, 5VDD, P_VTT, and Vbat

Note: In the Windows OS environment, the Supero Doctor III settings take precedence over the BIOS settings. When first installed, Supero Doctor III adopts the temperature threshold settings previously set in the BIOS. Any subsequent changes to these thresholds must be made within Supero Doctor, since the SD III settings override the BIOS settings. For the Windows OS to adopt the BIOS temperature threshold settings, please change the SDIII settings to be the same as those set in the BIOS.

4-5 Security

Choose Security from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. Security setting options are displayed by highlighting the setting using the arrow keys and pressing <Enter>. All Security BIOS settings are described in this section.


PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Main Advanced Security Boot Exit
Supervisor Password Is:
User Password Is:
Set Supervisor Password
Set User Password
Password on boot: [Disabled]
Item Specific Help
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Supervisor Password Is:

This feature indicates if a supervisor password has been entered to the system. Clear means such a password has not been used, and Set means a supervisor password has been entered.

User Password Is:

This feature indicates if a user password has been entered to the system. Clear means such a password has not been used, and Set means a user password has been entered.

Set Supervisor Password

When this item is highlighted, press the <Enter> key. When prompted, enter the Supervisor's password in the dialogue box to set or to change supervisor's password to allow access to the BIOS.

Set User Password

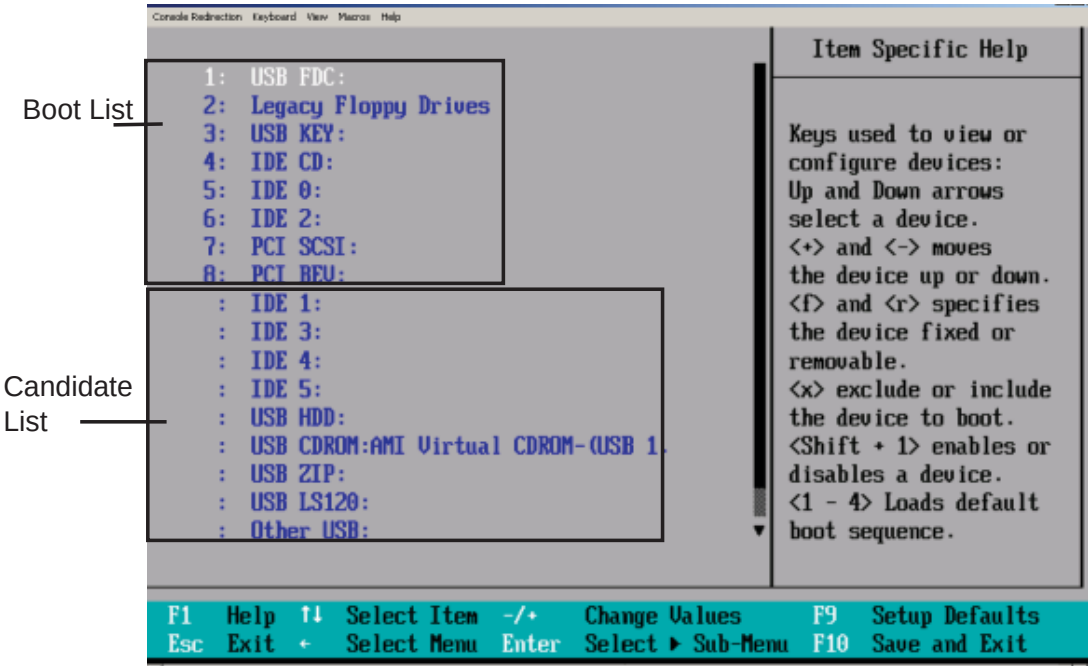
When the item is highlighted, hit the <Enter> key. When prompted, enter the user's password in the dialogue box to set or to change the user's password, which will allow access to the system at boot-up.

Password on Boot

This setting allows you to determine if a password is required for a user to enter the system at bootup. The options are Enabled (password required) and **Disabled** (password not required).

4-6 Boot

Choose Boot from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. See details on how to change the order and specs of boot devices in the Item Specific Help window. All Boot BIOS settings are described in this section.

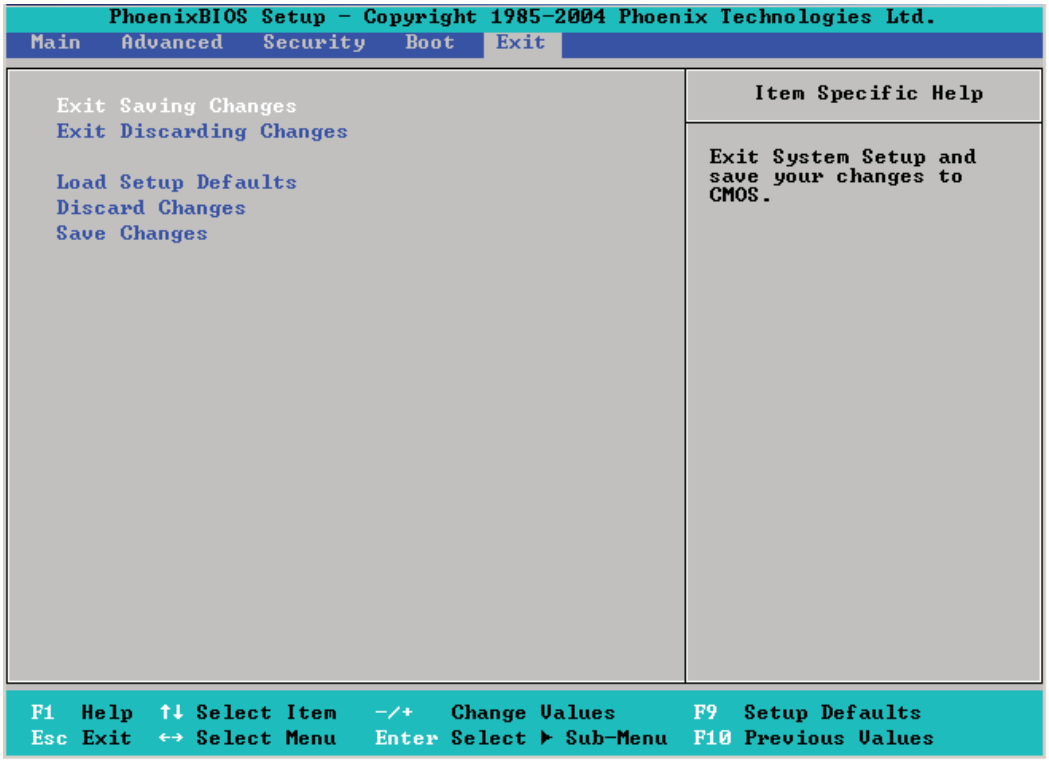

Boot List
Candidate List
1: USB FDC:
2: Legacy Floppy Drives
3: USB KEY:
4: IDE CD:
5: IDE 0:
6: IDE 2:
7: PCI SCSI:
8: PCI BEV:
: IDE 1:
: IDE 3:
: IDE 4:
: IDE 5:
: USB HDD:
: USB CDROM:AMI Virtual CDROM-(USB 1.
: USB ZIP:
: USB LS120:
: Other USB:
Item Specific Help
Keys used to view or configure devices:
Up and Down arrows select a device.
<+> and <-> moves the device up or down.
<f> and <r> specifies the device fixed or removable.
<x> exclude or include the device to boot.
<Shift + 1> enables or disables a device.
<1 - 4> Loads default boot sequence.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ← Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Boot Priority Order/Excluded from Boot Orders

The items included in the boot list section are bootable devices listed in the sequence of boot order as specified. The items included in the candidate list are currently not bootable. Use the <+> key or the <-> key to move the device up or down. Use the <f> key or the <r> key to specify the type of USB device, either fixed or removable. You can select one item from the boot list and hit the <x> key to remove it from the list of bootable devices (to make its resource available for other bootable devices). Conversely, you can select an item from the candidate list and hit the <x> key to remove it from the candidate list and put it in the boot list to make it bootable. See details on how to change the priority of boot order of devices in the "Item Specific Help" window.

4-7 Exit

Choose Exit from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. All Exit BIOS settings are described in this section.


PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Main Advanced Security Boot Exit
Exit Saving Changes
Exit Discarding Changes
Load Setup Defaults
Discard Changes
Save Changes
Item Specific Help
Exit System Setup and save your changes to CMOS.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Exit Saving Changes

Highlight this item and hit <Enter> to save any changes you have made and to exit the BIOS Setup utility.

Exit Discarding Changes

Highlight this item and hit <Enter> to exit the BIOS Setup utility without saving any changes you may have made.

Load Setup Defaults

Highlight this item and hit <Enter> to load the default settings for all items in the BIOS Setup. These are the safest settings to use.

Discard Changes

Highlight this item and hit <Enter> to discard (cancel) any changes you have made. You will remain in the Setup utility.

Save Changes

Highlight this item and hit <Enter> to save any changes you have made. You will remain in the Setup utility.

Appendix A
BIOS Error Beep Codes

During the POST (Power-On Self-Test) routines, which are performed each time the system is powered on, errors may occur.

Non-fatal errors usually allow the system to continue with bootup. The error messages normally appear on the screen.

Fatal errors will not allow the system to continue with bootup in most cases. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

The following table displays non-fatal BIOS Beep codes.

BIOS Error Beep Codes

Beep Code	Error Message	Description
1 beep	Refresh	Circuits have been reset. (Ready to power up)
Repetition of the pattern of (1 long beep+ a short pause)	Memory error	No memory detected in the system
1 long beep + 2 short beeps	Display memory read/write error	Video adapter missing or with faulty memory
1 continuous beep (with the front panel OH LED on)	System Overheat	1 continuous beep with the front panel OH LED on)

Notes

Appendix B

Installing the Windows OS

After all hardware components have been installed, you must first configure Intel South Bridge RAID Settings before you install the Windows OS and other software drivers. To configure RAID settings, please refer to RAID Configuration User Guides posted on our website at www.supermicro.com/support/manuals.

B-1 Installing the Windows XP/2000/2003 OS for Systems with RAID Functions

1. Insert Microsoft's Windows XP/2000/2003 Setup CD in the CD Driver, and the system will start booting up from CD.

2. Press the <F6> key when the message-" Press F6 if you need to install a third party SCSI or RAID driver" displays.

3. When the Windows XP/2000/2003 Setup screen appears, press "S" to specify additional device(s).

4. Insert the driver diskette-"Intel AA RAID XP/2000/2003 Driver for ESB2" into Drive A: and press the <Enter> key.

5. Choose the Intel(R) ESB2 *SATA RAID Controller* from the list indicated in the XP/2000/2003 Setup Screen, and press the <Enter> key.

6. Press the <Enter> key to continue the installation process. (If you need to specify any additional devices to be installed, do it at this time.) Once all devices are specified, press the <Enter> key to continue with the installation.

7. From the Windows XP/2000/2003 Setup screen, press the <Enter> key. The XP/2000/2003 Setup will automatically load all device files and then, continue the Windows XP/2000/2003 installation.

8. After the Windows XP/2000/2003 OS Installation is completed, the system will automatically reboot.

B-2 Installing the Windows XP/2000/2003 OS for Systems without RAID Functions

1. Insert Microsoft's Windows XP/2000/2003 Setup CD in the CD Driver, and the system will start booting up from CD.

2. Continue with the OS installation. The Windows OS Setup screen will display.

3. From the Windows XP/2000/2003 Setup screen, press the <Enter> key. The XP/2000/2003 Setup will automatically load all device files and then continue with the Windows XP/2000/2003 installation.

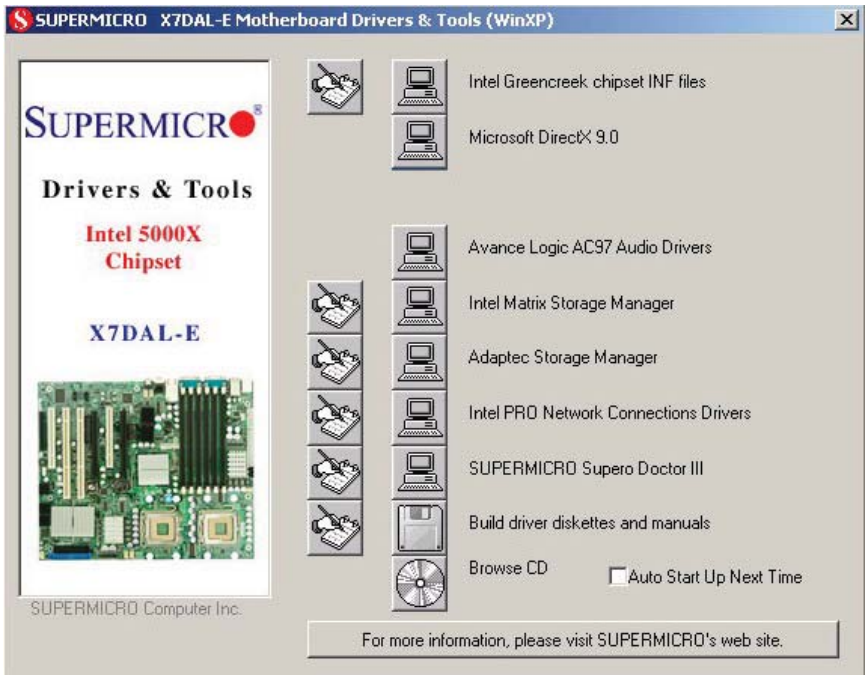
4. After the Windows XP/2000/2003 OS Installation is completed, the system will automatically reboot.

5. Insert the Supermicro Setup CD that came with your motherboard into the CD Drive during system boot, and the main screen will display.

Appendix C
Installing Other Software Programs and Drivers

C-1 Installing Drivers other than the Adaptec Embedded Serial ATA RAID Controller Driver

After you have installed the Windows Operating System, a screen as shown below will appear. You are ready to install software programs and drivers that have not yet been installed. To install these software programs and drivers, click the icons to the right of these items.



Driver/Tool Installation Display Screen

Note: Click the icons showing a hand writing on the paper to view the readme files for each item. Click a computer icon to the right of an item to install an item from top to the bottom one at a time. **After installing each item, you must reboot the system before proceeding with the next item on the list.** The bottom icon with a CD on it allows you to view the entire contents of the CD.

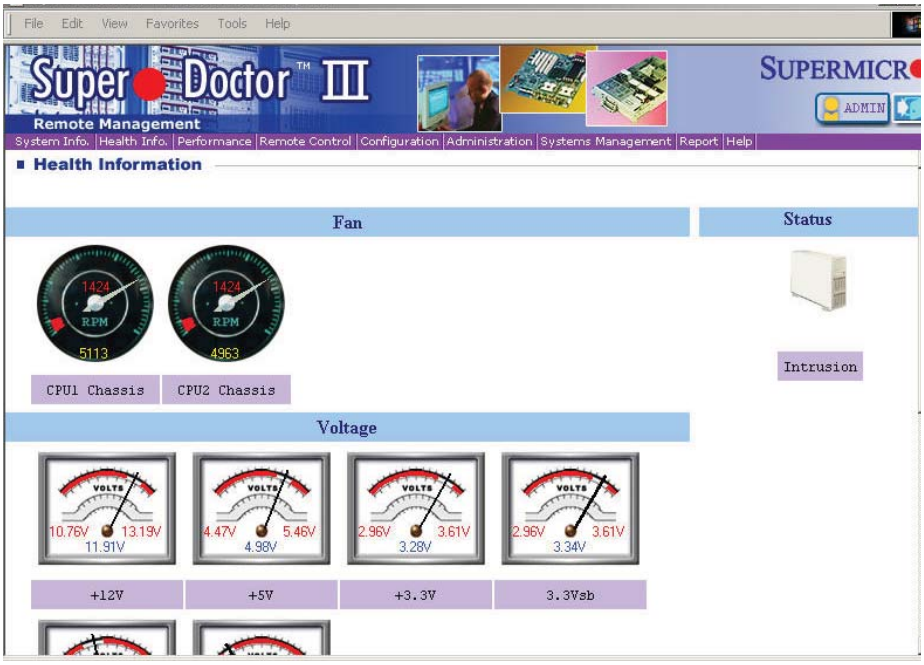
C-2 Configuring Supero Doctor III

The Supero Doctor III program is a web-based management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called the SD III Client. The Supero Doctor III program included on the CDROM that came with your motherboard allows you to monitor the environment and operations of your system. Supero Doctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a display of the Supero Doctor III interface.

Note 1: The default user name and password are ADMIN.

Note 2: In the Windows OS environment, the Supero Doctor III settings take precedence over the BIOS settings. When first installed, Supero Doctor III adopts the temperature threshold settings previously set in the BIOS. Any subsequent changes to these thresholds must be made within Supero Doctor, since the SD III settings override the BIOS settings. For the Windows OS to adopt the BIOS temperature threshold settings, please change the SDIII settings to be the same as those set in the BIOS.

Supero Doctor III Interface Display Screen-I (Health Information)



Supero Doctor III Interface Display Screen-II (Remote Control)

File Edit View Favorites Tools Help
Super Doctor III
Remote Management
SUPERMICR
ADMIN
System Info. Health Info. Performance Remote Control Configuration Administration Systems Management Report Help
Remote Control
Graceful Power Control
Open Console
Power Control
Enter
Comm.
Graceful power control
Supero Doctor III allows a user to inform the OS to reboot or shut down within a specified time (the default is 30 seconds). Before the system reboots or shuts down, it's allowed to cancel the action.
Requirements
Keep Supero SD3Service Daemon running at all times on this system.
Provide TCP/IP connectivity.
Power control

Note: The SD III Software program can be downloaded from our Web site at: ftp://ftp.supermicro.com/utility/Supero_Doctor_III/. You can also download the SDIII User's Guide at: http://www.supermicro.com/PRODUCT/Manuals/SDIII/UserGuide.pdf. For Linux, we will still recommend that you use Supero Doctor II.

Notes

(Disclaimer continued)

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